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ABSTRACT

The basic objective of this monograph is to present and review a few selected theories of person-environment interaction which have stimulated meaningful research. Five theoretical viewpoints are included: Barker's theory of behavior settings, the subcultural approach, Holland's theory of personality types and model environments, Stern's need x press=culture theory, and Pervin's transactional approach. These theories are, for the most part, psychological in nature, but most of them evidence some interdisciplinary anchorings. Research related to the theories is synthesized and the theories are compared. In addition, the theoretical and applied implications of each theory are discussed and evaluated. Lists of references and ACT publications conclude the volume. (Author/KM)

THEORIES OF PERSON-ENVIRONMENT INTERACTION

THEORIES OF PERSON-ENVIRONMENT INTERACTION: IMPLICATIONS FOR THE COLLEGE STUDENT

W. BRUCE WALSH

THE AMERICAN COLLEGE TESTING PROGRAM

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PREFACE

The basic theme of this monograph comes from Lewin's dictum that "behavior is a function of personality and environment." Lewin showed us that the setting is as important as the person, and both must be analyzed in order to understand behavior. This theme suggests the primary objective of this monograph, and that is to organize significant person-environment research. This is done within a framework of five relevant theoretical approaches. The five approaches included here were selected because they were able to make possible some sensible predictions concerning the individual using the person-environment relationship. The five are Barker's behavior-setting theory, the subcultural approach, Holland's theory of personality types and model environments, Stern's need x press = culture theory, and Pervin's transactional approach. Significant research related to the five different approaches has been conducted using college student populations. As much as anything this reminds us that the research findings here clearly have implications for the college student and his environment. Beyond this application to higher education, the monograph reviews research related to the theories and provides both an evaluation and a comparison of the theories.

Bruce Walsh was an American College Testing Program Postdoctoral Fellow during the summer of 1970. During that time he continued work on the manuscript using the ACT and University of Iowa library facilities. Conversations and seminars with ACT staff members and other ACT summer fellows provided opportunities for discussion and analysis of the theoretical viewpoints.

Not every reader will agree with Walsh's presentation and analysis of the theoretical viewpoints. We hope, however, that it encourages people concerned with the day-to-day lives of college students to think in new ways, and that it helps researchers in higher education realize that work in the social sciences, including social psychology, can extend our understanding of college student development. The American College Testing Program is pleased to make this monograph available to the educational community. We believe it is a significant contribution to the literature on person-environment interaction.

Leo A. Munday, *Vice President*
Research and Development Division

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Many of the above people have influenced me, but I alone am responsible for the failings and shortcomings of this manuscript.

W. B. W.

ABOUT THE AUTHOR

W. Bruce Walsh is a native of State College, Pennsylvania. He received a BS in economics from Pennsylvania State University in 1959, an MA in sociology from Kent State University in 1961, and a PhD in education from The University of Iowa in 1965. That same year he joined The Ohio State University staff as an assistant professor of psychology. He has done research in the areas of vocational psychology, person-environment interaction, and the validity of self-report; and his articles have appeared in a number of scholarly journals in the United States. He has also coauthored two books on behavior modification with Samuel H. Osipow and is currently a member of the editorial board for the *Journal of College Student Personnel* and an editorial consultant for the *Journal of Vocational Behavior*. Walsh is currently Associate Professor of Psychology at The Ohio State University.

INTRODUCTION

It makes sense to assume that our surroundings have a great deal to do with the development of our intellectual powers and personality patterns. The environment and, in particular, our perception of it compose a large part of input into our minds (Parr, 1970). Indeed, during the past decade research into person-environment interaction has increased immensely. Some significant proportion, though hardly all, of the published research has been explicitly related to stated theoretical approaches. The purpose of the present volume is to organize selected portions of the literature on person-environment interaction within a framework of relevant theoretical approaches. Thus, this monograph is concerned with certain theoretical approaches and research which focus on behavior as a function of the individual and his environment. Different individual-environment relationships are explored in terms of the outcomes (such as achievement and satisfaction) for the individual.

In selecting the theories to be included in this monograph, one basic criterion was considered: each theory was to have a set of assumptions (implicit or explicit) relevant to the relationship between the individual and the environment along with the necessary empirical definitions. Thus, the theory should be able to make predictions concerning the individual (for example, performance or satisfaction) using the person-environment relationship. Based on this notion, the following five theoretical viewpoints have been included in this monograph: (1) Barker's theory of behavior settings, (2) the subcultural approach, (3) Holland's theory of personality types and model environments, (4) Stern's need x press = culture theory, and (5) Pervin's transactional approach. The theories are primarily psychological in nature (with the possible exception of the subcultural approach), although most of them exhibit some interdisciplinary anchorings. The subcultural approach was included mainly because of the consistency of this approach with Barker's behavior setting theory; the various subcultures identified seem to be examples of large behavior settings. Obviously, other significant models and works (for example, Astin, 1965b; Chickering, 1969; Heath, 1964; Katz, 1968; Pace, 1969a; Sanford, 1966; Thistlethwaite, 1965, 1968) could have been included. Much of this work has focused on college impact and student development. However, the manuscript is not an exhaustive treatment of all person-environment approaches, nor is it an

attempt to rewrite extant reviews (such as *The Impact of College on Students*, Feldman & Newcomb, 1969). The basic purpose of the monograph is to present and review a few selected theories in this area that have to a relatively significant extent stimulated meaningful research. Other goals include that of synthesizing the current research associated with the theories as well as a direct comparison of the theories.

Relevant Issues and the Individual-Environment Relationship

In considering person-enyironment relationships, one significant decision is whether to focus on the perceived or physical environment. Some of the theories presented here focus primarily on the psychological environment or on the subjective frame of reference. One of the earliest expressions of this phenomenological orientation was by Koffka (1935) in his book *Principles of Gestalt Psychology*. Koffka, using his concept of the behavioral environment, defined the environment not as it is, but as it is perceived and experienced. He maintained that the relationship between behavior and the geographical environment must remain obscure without the mediation of the behavioral environment. The phenomenological approach was further expanded by Lewin's (1936) field theory conception of life space. To Lewin, behavior is a function not of the objective physical properties of the stimulus world, but of a world transformed into an "inner world" (psychological environment) by a cognizing organism. Another theorist (Murray, 1938) has drawn upon this basic orientation, and the thrust remains primarily psychological. Thus, according to this approach the physical world can affect the individual only through his or her perceptions or experiences of it. It is the psychological environment, not the physical environment, that determines the way in which the individual will respond.

In contrast, a presumably more "objective" approach to the environment has its roots in experimental psychophysics and Watsonian behaviorism (Prohansky, Ittelson, & Rivlin, 1970). Their position assumes that a sound theory of behavior cannot be based on the subjective self-report about the meaning of physical environment. Thus, theories assuming this position tend to overlook individual differences in the way in which the same stimulus is experienced. Instead, the focus is on the relationship between the physical environment (operationally defined in terms of discrete quantifiable stimuli) and specific functional behaviors. This approach has certainly helped us understand the nature of human psychological functions (perceiving, thinking, learning, and feeling); nevertheless, it may still be argued that we have scant knowledge about man's behavior in a complex social setting (Prohansky et al., 1970).

In regard to the theories discussed here, Pervin (1968a) and Stern (1970) have defined the behavioral environment according to the individual's perceptions of it and his reactions to these perceptions. A limitation of this phenomenological approach is that the theories within this orientation fail to take sufficient note of how behavior is influenced by the stimulus situation and by the physical nature of

the environment. Stern (1970) has attempted to compensate for this limitation by aggregating an individual's perceptions of the environment. However, there is evidence that aggregation across individual student behavior does not produce exactly the same results as perceptions or images that students have of their schools (Feldman, 1969). Yet it is possible that the aggregate environment phenomenologically may be the "best estimate" of the environment that can be made. The actual environment in some respects is similar to a true score (an ideal) which makes definition and measurement very complex. Another definition of the environment has been introduced by Holland (1966a), who suggested that the dominant features of an environment are dependent upon the typical characteristics of its members. Holland's measurement technique entailed a census of the self-reported preferences and behaviors of the members of a population. This definition to some extent suggests how individuals behave in different environments. The two remaining theories discussed in this monograph suggest that the environment tends to determine behavior. Barker (1968) in his work is primarily concerned with describing the behavioral environment. His behavior setting theory suggests that environments select and shape the behavior of people who inhabit them. The various subcultures discussed under the subcultural approach seem, in effect to be large behavior settings. In other words, consistent with behavior setting theory, subcultures seem to have a coercive influence upon the behavior of their members. A possible limitation of the latter theories (Barker, Holland, and the subcultural approach) is that perceived environment is not reported or measured.

Another relevant issue in the discussion of person-environment relationships involves the units to be used to analyze individuals and environments. Needs, attitudes, opinions, values, types, and perceptions have been used as units in any number of studies. Such diversity makes it difficult to identify convergencies and divergencies in findings (Pervin, 1968). According to some theorists, knowledge begins with the discrimination of differences; but differences are explained by reference to similarities. In any event, the studies which have used the units mentioned above have focused primarily on the individual's thinking responses. In studying environment-behavior relations, Barker (1968) suggested that the environment and the behavior must be described and measured independently. Thus, to Barker the environment cannot be investigated by using just the individual's behavior. Others (Lewin, 1951; Murray, 1951) have suggested that perhaps the same units or commensurate dimensions should be used to assess the individual and the environment. This suggestion raises the problem of the development of commensurate dimensions that will not destroy either environmental or behavioral units.

The theories considered in this book show variability in the units used to analyze individuals and environments. For example, Barker (1968) in his behavior setting theory suggests there is an association between the number of people in a behavior setting and the frequency and intensity of certain behaviors emitted by the inhabitants in the setting. Thus, Barker primarily uses behavioral units to analyze the effect of the environment on the individual. The subculture models focus on

describing the environment in terms of the attitudes, values, behaviors, and roles of its members. An implicit assumption is that people will tend to enter and to participate in environments that tend to be consistent with their personal characteristics. Holland (1966) in his theory assumes that vocational interests are an expression of personality, and he subsequently uses self-reported vocational interests to identify personality orientation. He further suggests that people tend to seek out and to enter environments consistent with their interests. Thus, his basic unit of analysis seems to be self-reported vocational interests. Stern (1970) in his work analyzes the person and the environment in terms of personality needs and perceptions of the environment. Both needs and perceptions in this theory are inferred from self-reports. The person and the environment are inferred from these reports. The unit used by Pervin (1968a) to analyze the person and the environment is perceptions. The person is defined in terms of self-reported self-perceptions (self-concept) and the environment is defined in terms of individual self-reports.

The above discussion certainly suggests that the theories presented here tend to vary on a number of variables. The focus on the psychological environment varies across the theories. Likewise, the focus on the physical environment varies from theory to theory. Furthermore, the concepts and the units used to operationally define the individual and the environment vary from theory to theory. In this frame of reference, there does not seem to be a single substantive operational definition of person-environment interaction which can be implemented with any generality. In other words, the means by which a given person defines person-environment interaction is related to his or her specific preference (approach) or theoretical frame of reference. Consequently, once the investigator has accepted a given approach or theory of person-environment interaction, his or her definition will be related to that theory. Therefore, individual-environment relations may be defined by the particular empirical or operational concepts (explicit or implicit) designated by a given theoretical orientation. A theory of individual-environment relations then consists ideally of a set of descriptive operational concepts which describe the relationship between the individual and the environment using the concepts and dimensions related to the particular approach or theory.

The Nature of Theory

The present volume attempts to organize the literature on selected theories of person-environment interaction. But what constitutes theory? Scientists have given us many definitions. Theory has been defined as a provisional systemization of events; it enables us to see relationships between one fact and another (McCabe, 1958). Another definition views a theory as a statement of the relations believed to prevail in a comprehensive body of facts (English & English, 1958). Theory has also been defined as a human convention for keeping data in order (Pepper, 1961). Brodbeck (1960) defines theory as a connected set of laws. A law suggests that whenever there is an instance of one kind of fact or event, there is also an instance of another kind of fact or event.

Common to all the above definitions is the element that theory is a device which enables us to recognize the relationships among facts. In addition, these definitions seem to have in common the elements of reality and belief (Stefflre, 1965). Reality is the data or behavior we perceive and attempt to explain. Belief is the method by which we attempt to make sense out of the data by relating what we see to possible explanations of it. To Pepinsky and Pepinsky (1954) theory is a possible world which can be checked against the real world. Thus, theory building develops out of our need to make sense out of life (Stefflre, 1965).

In general, theory in the behavioral sciences has its roots in the more sophisticated physical sciences. The theoretical structures which have served physical scientists have been used as models in order to guide the development of theories in other disciplines. Thus, a formal theory has certain characteristics. First, the theory rests on a set of unproven assumptions. These assumptions define the field which the theory is investigating. The assumptions must be verifiable, susceptible to development, and suggest deduction of observable data. A theory is scientific only if it admits to testing and development (Eysenck, 1952). Second, concepts are operationally defined in order that they may be related to observational data in research experiments. The stated assumptions and operationally defined concepts make possible the development of testable hypotheses. The theory should predict new facts or relations and organize and interpret existing knowledge in a meaningful frame of reference.

If we searched for a formal theory of person-environment interaction using the requirements described above, we would find none. At best, the theories are only hypotheses, partial theories, or theoretical orientations. However, each theory discussed in this monograph is reviewed in terms of the formal criteria (listed below) of a sound theory in order to determine the effectiveness of a given "theory" in relating empirical observations.

To begin with, an effective theory is comprehensive. This criterion means that a theory should generate predictions which are generally related to the range of empirical data upon which the theory can focus. In this regard, the theory should make predictions concerning a wide variety of human behavior. A second criterion is that the assumptions and concepts of a theory should be clearly, precisely, and explicitly stated. A third criterion specifies that a theory should permit the inclusion of extant empirical findings within a logical, consistent framework. Thus, a theory is a means of organizing and interpreting known knowledge concerning a related set of events. Another attribute (the fourth criterion) focuses on the simplicity or parsimony of the theory. An effective theory is termed parsimonious if it does not overexplain phenomena in which we are interested. In essence, a theory which is parsimonious tends to be more communicable and understandable. The final criterion, and probably the most significant attribute of a theory, is concerned with the empirical research generated by the theory. If a theory can be shown to have had developmental effect upon relevant areas of research, we would most likely have

to conclude that it is an effective theory. Of course, a judgment must be made regarding the definition and meaning of relevant research.

We have said that a theory consists of a set of related but unproven assumptions concerning the empirical phenomena and operational definitions which relate concepts to empirical observation. Consequently, we have the specification that a theory of person-environment interaction must have a set of assumptions relevant to the relationship between the individual and the environment along with the attendant empirical definitions of each. In being relatively comprehensive the theory must be able to make predictions concerning the person-environment relationship. In these respects, it is clear that the prevailing theories are certainly imperfect, largely unvalidated, and of limited effectiveness in practical application. They are at best theory fragments; yet they hold potential for the future development of the area of person-environment interaction.

Indeed, each of the theories generally has difficulty in meeting most of the formal attributes of a theory previously cited. Nevertheless, it still makes sense that some attempt at theory should accompany empirical findings in order to help orient a body of knowledge while it is in a developmental stage. Consequently, a strong case can be made for the usefulness of partial "theories" in the early stages of the development of a discipline (Osipow, 1968).

What function, then, do the theoretical approaches serve for the investigator who supports and uses them? It seems that the approaches at least represent a group of attitudes (implicit if not explicit) concerning the relationship between the individual and the environment which in a broad way delimit areas of relevant investigation. Each "theory" does have its assumptions, even though at times they are not clearly stated. Consequently, the approaches—in stimulating research—aid the process of identifying and defining relevant concepts and variables which are needed in the area of person-environment interaction. In short, the "theories" discussed in this monograph do not only serve a heuristic value but also stimulate research and thinking even though they lack the formal attributes of theory.

Plan of the Monograph

Each chapter, except for the first and last, is divided into six basic parts: introduction, background and development, theory, research, evaluation, and implications. The introduction sections are informative about the individuals who developed the theories. The background and development sections contain information about the nature and origin of the theories. The theory sections contain nonevaluative descriptions of the theories in terms of their implicit as well as their explicit assumptions, the operational definitions of the major variables, and the validity and reliability of these operational definitions. Research reviewed in the validity sections is primarily concerned with the validity (concurrent and predictive) of the instruments used to operationalize the concepts of the theory.

Concurrent validity here is defined by the relationship between test scores and status on external variables in the present (Horst, 1966). Horst defined predictive validity as the relationship between test scores and performance on future criteria. This type of validity is based on the effectiveness of a test in predicting some future outcome. It is recognized that both types of validity (concurrent and predictive) are associated with construct validity. Construct validity refers to the relationship between test scores and theoretical predictions. In this monograph, research testing the theoretical predictions of the theories is presented in the research sections. This format is a matter of personal preference; overlap certainly exists between the validity sections and the research sections. In the reliability sections primarily three forms of reliability (test-retest, equivalent-form, and split-half) are reviewed. The research sections focus on relevant research stimulated by the theories and directly and indirectly (other relevant research) testing the theoretical predictions of the theories. The other relevant research sections attempt to interpret indirectly related research within the different theoretical viewpoints. In general, the research sections present results of studies which rely on the validity of the formulations for both the individual and the environment, as well as their operational definitions. In the evaluation sections the theories are reviewed in terms of the formal criteria previously discussed. Finally, the implications sections consider the theoretical, research, and applied implications of the theories.

The monograph itself consists of seven chapters. This introductory chapter has focused on the role theory plays in the development of approaches to person-environment interaction. Chapters 2 through 6 review five different theoretical viewpoints on person-environment interaction. The theories are ordered and presented on a continuum from least phenomenologically oriented to most phenomenologically oriented. The least phenomenologically oriented theories have attempted to define the environment more "objectively." The more phenomenologically oriented theories have attempted to define the environment as it is perceived. Chapter 2, then, presents Barker's (1968) behavior setting theory. The basic rationale for this theory is that behavior settings tend to select and shape the behavior of people who inhabit them. Human environments seem to have a coercive influence upon human behavior. The subcultural approach which is the topic of Chapter 3 is in some ways consistent with behavior setting theory. This approach proposes that subcultures (large behavior settings) have a coercive influence upon the behavior of their members. Thus, these two theoretical viewpoints tend to emphasize the effect of the environment upon behavior. Chapter 4 reviews Holland's (1966) theory of personality types and model environments. The basic motif of Holland's work is that congruent person-environment relations are generally conducive to individual stability, achievement, and satisfaction. Stern's (1970) need x press = culture theory (Chapter 5) is based upon the work of Lewin (1936), who contended that behavior is a function of the person and the environment. In the Lewin frame of reference, Murray (1938) developed a need-press model. The further development by Stern is based on an operational definition of the Murray need-press model. Chapter 6 treats Pervin's (1968a) transactional approach. The theme of Pervin's work is that an individual will tend

to be most satisfied and productive in an environment which moves him from his perceived self toward his ideal self-concept. The final chapter (7) is devoted to a summary and a comparison of the theories.

Summary

The basic objective of the monograph is to present and review a few selected theories of person-environment interaction which have stimulated meaningful research. Five theoretical viewpoints are included in this monograph: Barker's theory of behavior settings, the subcultural approach, Holland's theory of personality types and model environments, Stern's need x press = culture theory, and Pervin's transactional approach. These theories are, for the most part, psychological in nature, but most of them evidence some interdisciplinary anchorings. Two other objectives of this monograph are a synthesis of research related to the theories and a comparison of the theories. In addition, an attempt is made to evaluate and discuss the theoretical and applied implications of each theory.

BARKER'S THEORY OF BEHAVIOR SETTINGS

Introduction

What is known as Ecological Psychology is chiefly associated with the name Barker, although others have, of course, contributed to its development.

Roger Garlock Barker (1903-) was educated at Stanford University, receiving his undergraduate and graduate degrees there. He obtained his PhD in 1934 and worked with Kurt Lewin at the Iowa Child Welfare Research Station. In 1947 Barker went to the University of Kansas as professor and head of the Department of Psychology. For the next 22 years he created and implemented a research program which focused on the study of human behavior and its natural environment. To facilitate the research program, the Midwest Psychological Field Station was established in 1947 by Barker and Herbert F. Wright. Another station for comparative studies has functioned in Leyburn, Yorkshire, England since 1954.

Background and Development

The basic rationale for Barker's theory of behavior settings is that environments select and shape the behavior of people who inhabit them. It is maintained in this view that people tend to behave in highly similar ways in specific environments, regardless of their individual differences as persons. Thus, human environments seem to have a coercive influence upon human behavior. The theory set forth by Barker is thoroughly presented in his recent book *Ecological Psychology* (1968).

In developing his theory, Barker has drawn upon a paper by Heider (1959) entitled "Thing and Medium." Heider noted that objects in the environment have physical properties which differ from the behavior that intervenes between these objects and the organism. He labeled the former objects *things* (behavior settings) and the latter entities *media* (people). Heider then discussed two differences between things and media. First, things are internally constrained, and they are relatively independent of external stimuli for their forms and energy. A tree is an example of an object. On the other hand, media are docile. Media to a degree are externally constrained, and

they are relatively dependent upon external stimuli for the form and energy they exhibit. The pattern of light through a tree is an example. The pattern of shade is determined in some way by the external tree.

The second distinguishing attribute of thing and medium is that things are unitary. The parts of things are interdependent upon each other. A change in one part causes a change in the next part. Therefore, the variety things can exhibit is limited by internal structure. Thus, it is difficult to change or alter a structured environment or behavior setting. However, the parts of a medium are independent of each other. Because an individual's behavior is more flexible than the structure of a behavior setting, the variety a medium may exhibit is quite versatile. Therefore, things are causal. Their influence is carried by media whose forms and processes are molded by things. Thus, behavior settings tend to influence the behavior of their inhabitants. If we are aware that A and B are related as thing to medium, it is possible to predict about B from information about A and to predict about A from information about B.

Theory

Assumptions

Three basic assumptions underlie Barker's theory of behavior settings. The assumptions were generated by Heider (1959) and focus on coupled phenomena that have a thing-medium relationship. The first assumption is that the media comply with the forces of the thing: people tend to be receivers and transducers in response to the structure and pattern of forces from the behavior setting. The second assumption states that the thing imposes its pattern upon media via its own driving forces: the behavior setting is the operator. The final assumption suggests that if we measure the docility of the media and measure the driving forces of the thing, it may be possible to account in some degree for the consequences which occur across person-environment boundaries.

Behavior Setting: An Operational Definition

The attributes of a behavior setting are both structural and dynamic. In structure, a behavior setting consists of one or more standing patterns of behavior with the surrounding environment similar in form to the behavior. The dynamic element suggests that the behavior-milieu parts of a behavior setting have a degree of interdependence among themselves that is greater than their interdependence with parts of other behavior settings.

A behavior entity is something that is real and distinct. It is composed of one or more standing patterns of behavior. A standing pattern of behavior is a behavior entity with a precise and delimited position in time and space (e.g., a basketball game, a worship service, or a piano lesson). The behavior patterns of a behavior

setting are related to nonbehavioral phenomena (milieu). The milieu of a behavior setting exists independently of the standing pattern of behavior. For example, the milieu for a club would be the club's written constitution, the minutes book, the roll of members, the meeting place, and so forth. Furthermore, the surrounding milieu is similar in form and in structure to the behavior (i.e., reading the minutes or calling the roll). The above mentioned behavior-milieu parts are called synomorphs. Structurally, a behavior setting is a set of such synomorphs. The synomorphs have a specified degree of interdependence, and the degree of interdependence is greater among themselves than with parts of other behavior settings (Barker, 1968).

In order to operationally define and describe behavior settings, Barker (1968) and others have developed a Behavior Setting Survey (BSS). The BSS compared with other environmental measures discussed in this monograph is considered to be the most objective method for measuring and describing the environment. The basic operations involved in the BSS are as follows:

1. Identifying potential behavior settings.

2. Eliminating potential settings that do not meet the criteria of behavior settings.

3. Describing the behavior settings.

The first operation involves making a list of potential behavior settings. The list includes all parts of the community (business, church, government, school, and social and voluntary groups) which may fit the definition of a behavior setting. A sample list of potential settings is shown in Table 1.

The next task of the BSS is to eliminate potential settings from the list that do not meet or fit the definition of a behavior setting. The three tests for identifying any part of a community as a behavior setting are the structural test, the internal dynamics test, and the external dynamics test. The structural test determines whether or not a part of a community is a behavior-milieu synomorph. A synomorph is defined as a standing pattern of behavior related to a particular milieu in time and space, and the surrounding milieu is similar in form and in structure to the behavior. These characteristics are used to eliminate community parts that are nonsynomorphs. The synomorphs identified are now tested by the internal dynamics test. This test investigates the degree of interdependence between the synomorph and other behavior-milieu synomorphs. Finally, the external dynamics test determines the degree of interdependence between the synomorph and structurally external synomorphs.

The internal and external dynamics tests are operationalized by means of the K-21 index of interdependence. This index assumes that synomorphs are interdependent and that the degree of interdependence may be assessed according to

TABLE 1
Sample List of Potential Settings

Category	Setting
Business	1. *Drugstore
	2. Fountain of Drugstore
	3. Pharmacy of Drugstore
	4. Variety Department of Drugstore
	5. *J. Wiley, Attorney's Office
	6. *Barber Shop
	7. *J. Wiley, Music Lessons
Church	8. Methodist Church
	9. *Joash Worship Service at Methodist Church
	10. *Adult Choir Practice at Methodist Church
	11. Presbyterian Church
	12. *Worship Service at Presbyterian Church
	13. Anthem by Presbyterian Church Choir
Government	14. *County Treasurer's Office
	15. *Payment of Taxes at County Treasurer's Office*
	16. *Courthouse Square
	17. Sitting on Benches of Courthouse Square
Voluntary Association	18. *Boy Scout Troop 72 Meeting
	19. Tenderfoot Test at Scout Meeting
	20. Beaver Patrol Activities at Scout Meeting
	21. *4-H Club*
	22. *Skating Party of 4-H Club
	23. *Regular Meeting of 4-H Club
	24. Election of 4-H Club Officers
	25. *Achievement Banquet of 4-H Club
	26. *Hopscotch Games*
	27. March 3 Meeting of Couples Bridge Club
	28. April 1 Meeting of Couples Bridge Club
	29. May 2 Meeting of Couples Bridge Club

[*Continued*]

TABLE 1-[*Continued*]

Category	Setting
School	30. High School
	31. *High School Senior Class*
	32. *Box Social by Senior Class
	33. Bingo Game
	34. Walk for a Cake
	35. *High School Gym*
	36. *Girls' Locker Room
	37. *Brick-Paved Area in Front of High School*
Miscellaneous	38. *Trafficways
	39. *State Highway*

*Behavior settings, i.e., community parts that pass both structure and dynamic tests.

Items in italics are not behavior-milieu synomorphs according to the structure test; they are not tested by the dynamics tests.

Source: Reprinted with the permission of the publisher from *Ecological Psychology: Concepts and Methods for Studying the Environment of Human Behavior* by Roger G. Barker (Stanford: Stanford University Press, 1968) p. 36.

specific criteria. Thus, the value of K for a pair of synomorphs consists of the ratings on the following seven scales of interdependence:

1. The behavioral scale assesses the degree to which the behavior in one synomorph affects another synomorph.

2. The population scale focuses on the degree to which the people who enter one synomorph also enter another.

3. The leadership scale assesses the degree to which the same leaders are active in two synomorphs.

4. The spatial scale measures the degree to which the synomorphs use the same physical space.

5. The temporal contiguity scale focuses on the degree to which two synomorphs occur at the same time.

6. The behavior objects scale is concerned with the degree to which two synomorphs use the same behavior objects.

7. The behavior mechanism scale assesses the degree to which behavior mechanism is similar in two synomorphs.

Each measure is rated on a 7-point scale. A rating of 1 indicates the highest degree of commonality while a rating of 7 suggests the least. The interdependence index for two synomorphs is equal to the sum of the ratings on the seven measures. The index may thus range from a score of 7 (maximal interdependence) to a score of 49 (minimal interdependence). A pair of synomorphs with K values of 20 or less indicates a degree of interdependence consistent with a single behavior setting. A set of synomorphs with K values of 21 or higher are discrete settings. The cutting-point value of K was set at 21 on an empirical basis. This value seemed to identify realistically separate behavior settings. However, Barker suggests that values of K found to be between 18 and 22 should be reconsidered.

For example, two meetings of a poker club on consecutive Friday nights at the same place are structurally discrete synomorphs. On these two different occasions the same people and leaders are occupying the same place and using the same behavior objects and mechanisms. The two meetings of the poker club are similar on five of the measures of K (2, 3, 4, 6, and 7). However, two meetings of different poker clubs would be similar on only two of the measures (6 and 7). Obviously, the two meetings of the same poker club have a higher degree of interdependence and represent two occurrences of the same behavior setting. On the other hand, the two meetings of different poker clubs are single occurrences of different behavior settings.

Other examples of sets of synomorphs with different ranges of K values and the behavior settings they form are included in Table 2.

The final task of a BSS is to actually describe the behavior settings. Any number of attributes may be used, but the focus here will be on attributes used by Barker and Wright (1955) in their previous work. The first step in describing a behavior setting involves identifying the occurrence, duration, population, and occupancy time of a behavior setting during a year. The occurrence of a setting refers to the number of days in a year it exists for any period of time. The duration of a setting is equal to the total number of hours it functions during a year. The total number of different persons who inhabit a setting for any length of time during a year is defined as the population of the setting. Occupancy time is the total number of person-hours spent in a setting during a year. Some of this information may be available through records for a number of behavior settings (schools, church groups, and social organizations). Other data may be collected by means of observation in the field.

TABLE 2

Synomorphs, K Values, and Behavior Settings

Synomorph Sets	K Values	Behavior Settings
Third-Grade Reading Class Third-Grade Writing Class Third-Grade Arithmetic Class	14-16	Third-Grade Academic Subjects
Drugstore Fountain Drugstore Pharmacy Drugstore Variety Department	19-20	Drugstore
Twelve Monthly Meetings of Women's Club I	18-20	Women's Club I Meeting
Third-Grade Academic Subjects Fourth-Grade Academic Subjects Fifth-Grade Academic Subjects	28-30	Third-Grade Academic Subjects Fourth-Grade Academic Subjects Fifth-Grade Academic Subjects
Presbyterian Church Worship Service Presbyterian Church Sunday School Opening Exercises Presbyterian Church Members' Meeting Presbyterian Church Martha Circle Study Group	22-37	Presbyterian Church Worship Service Presbyterian Church Sunday School Opening Exercises Presbyterian Church Members' Meeting Presbyterian Church Martha Circle Study Group

Source: R. G. Barker, Ecological Psychology. Stanford, Calif.: Stanford University Press, 1968. Copyrighted by the Board of Trustees of the Leland Stanford Junior University, 1968, and reproduced by permission.

Another dimension included in the survey is penetration of behavior settings. Individuals are identified on this attribute according to their degree of involvement and responsibility in the setting. Six different degrees of involvement are defined: (1) onlooker, (2) audience or invited guest, (3) member or customer, (4) active functionary, (5) joint leaders, and (6) single leader. Individuals labeled 4, 5, or 6 are called performers in a behavior setting. Active functionaries are individuals who have power over a part of the setting, but they do not lead the behavior setting. The penetration into behavior settings may be rated for individuals or for population

subgroups. The population subgroups used by Barker include the following: infant (under 2 years); preschool (2 through 5); younger school (6 through 8); older school (9 through 11); adolescent (12 through 17); adult (18 through 64); aged (65 and over); male, female, white, Negro; and social class I, II, or III. The maximum depth of penetration of a subgroup is defined as the highest degree of involvement assumed by any member of the group during the survey year. Here again, some of this information for individuals and members of population subgroups may be available through existing records or newspapers. In some cases, observation within the behavior setting may be necessary.

Behavior settings are further described by identifying the dominant action pattern. The 11 possible action patterns are Aesthetics, Business, Education, Government, Nutrition, Personal Appearance, Physical Health, Professionalism, Recreation, Religion, and Social Contact. An action pattern rating reflects the proportion of the total occupancy time of a setting that is devoted to that particular area. Each action pattern is rated on a participation scale, a supply scale, an evaluation and appreciation scale, and a teaching and learning scale. The participation and supply variables are rated on a 6-point scale from 0 (the action pattern does not occur) to 5 (the action pattern occurs in 81 to 100% of the occupancy time). The evaluation and appreciation variable is rated on a 3-point scale: (0) no behavior in the setting evaluates or appreciates the action pattern, (1) less than half of the occupancy time of the setting is devoted to evaluation, and (2) more than half of the occupancy time of the setting is devoted to this task. The teaching and learning variable is rated in the same manner. The score for an action pattern is equal to the sum of the ratings on the four scales. The total score for a given pattern may thus range from 0 to 14. The higher the score, the more dominant the action pattern. For example, the midwest town team baseball game on the action pattern of recreation received a rating of 5 on participation, 0 on supply, 2 on appreciation, and 2 on learning. The total score of 9 indicates that a high proportion of the total occupancy time of the setting is devoted to this action pattern.

Barker (1968) has defined each action pattern and each scale assessing a given pattern. For example, the aesthetic action pattern is defined as any artistic activity or behavior focused on making the environment more beautiful. Ratings on the participation scale for this action pattern are determined by the time devoted to artistic behaviors (painting, decorating, landscaping, singing, dancing, etc.). The supply scale is concerned with whether or not the setting supplies art, cleaning, landscaping, musical materials, and equipment to beautify other settings. The evaluation and appreciation scale focuses on the time devoted to assessing products of art or persons with aesthetic talents or accomplishments. Ratings on the teaching and learning scale are determined by the time devoted to teaching and learning of art. The remaining 10 action patterns are elaborated and defined in Barker's (1968) recent book and will not be treated here.

The standing behavior patterns of behavior settings are also described in terms of five behavior mechanisms (Affective Behavior, Gross Motor Activity, Manipu-

lation, Talking, and Thinking). Each behavior mechanism is rated on a participation scale, a tempo scale, and an intensity scale. The participation scale assesses the degree of occurrences of a mechanism. This variable is rated on a 5-point scale using the following categories: (0) less than 10% of the occupancy time, (1) 10 to 33%, (2) 34 to 66%, (3) 67 to 90%, and (4) 90% or more of the occupancy time. The tempo variable is concerned with the average speed with which a mechanism normally occurs in a setting. For this measurement a 4-point scale is used with the normal speed being rated as (0) slow, (1) in the median range, (2) above the median range, or (3) near the physiological limit. The intensity scale focuses on the normal energy expended via the mechanism. The 4-point scale used to rate the normal energy expenditure is the same as the one above except for (0) 'low' is substituted for 'slow'. The score for a behavior mechanism is equal to the sum of the ratings on the three scales. Therefore, the total score for a specific mechanism may vary from 0 to 10. The higher the score, the more dominant is the behavior mechanism.

The behavior mechanisms and scales assessing a mechanism are defined separately. For example, the mechanism of talking includes all verbal behaviors (i.e., singing, yelling, crying, and cheering). The participation scale assesses the percentage of occupancy time of a setting that involves verbal behavior. The tempo scale measures the speed of the verbal behavior. The intensity scale assesses the loudness of the verbal behavior. The four other behavior mechanisms are specifically described in Barker's (1968) recent book.

Another variable used to describe behavior settings is a General Richness Index. This index assesses the variety of behavior in a setting. For example, persons participating in a behavior setting by means of different action patterns and different behavior mechanisms generate what is called a rich behavior setting with a variety of behaviors. The General Richness Index (GRI) for a particular setting may be computed by using the following formula:

$$GRI = \frac{(\Sigma PenR + \Sigma ApR + \Sigma BmR)\, cOT}{100}$$

where

PenR = the sum of the penetration ratings of the 14 population subgroups for the setting,

ApR = the sum of the ratings of the 11 action patterns for the setting,

BmR = the sum of the ratings of the four behavior mechanisms for the setting, and

cOT = code numbers of occupancy time for the setting. The occupancy time code table is available in Appendix I (Barker, 1968).

For example, we would expect a drugstore to have a higher GRI rating than a law office.

Pressure is an additional variable used to describe behavior settings. Pressure is defined in terms of the outside forces which stimulate a person to enter, withdraw from, or avoid a setting. The scale used to rate the pressure of behavior settings varies from (1) required to (7) prohibited. The other response alternatives are (2) urged, (3) invited, (4) neutral, (5) tolerated, and (6) resisted. The scale may be used to rate an individual or a population subgroup. Thus, for example, freshman college students are required to attend the first-semester English class. However, the pressure to enter student activities at many large universities is neutral.

One other variable is the welfare attribute. This variable describes the setting's services for various groups of people. For example, if a setting is not concerned with the welfare of the aged, it would be rated 0. If a setting serves aged members (recreation, care, employment, etc.), it receives a rating of 1. A 2 rating is assigned to a setting that serves the aged in other settings. A 3 rating is assigned to a setting where the aged serve members of other age groups, such as entertaining children.

A final variable measured by Barker is local autonomy. This variable is concerned with how four decisions (appointment of performance, admittance of members, determination of fees and prices, and establishment of fees and prices) regarding the operations of a setting occur within five geographical areas (within the town [9], within the school district [7], within the county [5], within the state [3], and within the nation [1]) varying in proximity to the setting. The proximity ratings (PR) for each locus of decision are constant as indicated above (9, 7, 5, 3, and 1) and remain the same for all decisions and settings. Thus, the rating problems for a decision are to identify the loci of persons or agencies involved in the decision and to judge the relative weight (RW) of each locus involved. Local autonomy for a specific decision is determined by multiplying PR x RW for each locus of decision and summing the products. The formula is written as follows:

$$\text{local autonomy} = \Sigma(PR \times RW).$$

A local autonomy rating is computed for each of the four decisions. The local autonomy for the setting is equal to the mean of the local autonomy ratings for the four decisions. Obviously, the highest autonomy rating across the four decisions is 9, indicating that the setting has complete local autonomy. If the local autonomy rating is 1 for a behavior setting, this indicates that the four decisions regarding operations are made at the national level.

For example, the inhabitants of a poker club (behavior setting) are all chosen within the immediate environment of Columbus, Ohio. The district, county, state, and nation do not influence the decision regarding who will participate. Therefore, on the decision about performers, the locus of within the town receives a relative weight of 1.00. All other loci of decision on this issue receive a rating of 0. Thus, the local autonomy rating for this decision is 9. For the other three decisions (admission of members, financial policies, and programs), the same result is obtained. Each decision receives a relative weight of 1 on the locus of within the town. Therefore,

the autonomy rating is 9 for each decision. The local autonomy for the poker club is equal to the mean of the local autonomy ratings for the four decisions or $\frac{36}{4} = 9$. In essence, the setting has complete local autonomy.

Reliability of the Behavior Setting Survey

Reliability (independent judges' ratings) has been studied for the 1,1 action patterns, the five behavior mechanisms, the K values, occupancy times, and depths of penetration of behavior settings. Barker and Wright (1955) reported that for all variables investigated, the agreement between independent judges' ratings was acceptable.

For example, the reliability of the index of interdependence was explored by having three judges compute K values for a sample of 100 synomorph pairs. The sample of 100 synomorphs represented every kind of relationship between synomorphs. For 89% of the synomorphs the judges agreed that the synomorphs were or were not behavior settings. Ratings of pairs of judges were correlated and the results were found to be high (.93, .93, and .92).

Reliability has not been explored for the variables of occurrence, duration, population, pressure, welfare, and local autonomy. According to Barker, there is no reason to believe that the above variables would be less reliable than the variables previously studied. In addition, for a number of the variables (occurrence, duration, and population) data are obtained from public records, publications, informants, and direct observation. Thus, accuracy is of concern and may be improved by checking clerical work, obtaining information from more than one informant, and by cross-checking findings with other variables. In any event, the reliability of these variables should be explored in order to lend additional credence to the BSS. Currently, the reliability data available indicate that the BSS procedures for identifying behavior settings are reliable.

Undermanned Behavior Settings

In order to draw inferences from behavior settings to their inhabitants and vice versa, Barker has explored the following hypothesis:

> There is an association between the number of people in a behavior setting and the frequency, intensity, origin, and termination of forces that impinge upon these people.

Thus, Barker refers to behavior settings with fewer than optimal inhabitants as undermanned behavior settings, and he differentiates in several ways between such settings and optimally manned settings. To begin with, the number of milieu forces acting upon each inhabitant in an undermanned behavior setting is greater. This is because the same forces are distributed among fewer people, with the

consequence that the number of forces per individual is greater. Next, the range of directions of the forces for each individual is greater because there are fewer people and each individual is therefore pressed in more directions. Consequently, the people in undermanned behavior settings, compared with those in optimally manned settings, are more active within the setting and are involved in a greater variety of actions. A four-man basketball team is an example of an undermanned setting. Each player plays harder, and the number of forces per player increases. Each player is involved in a variety of plays and moves in more directions. More stimuli impinge upon each player, and each player is required to make more responses. In summary, a decrease in the number of inhabitants required for optimal medium quality does not tend to change the standing pattern of behavior in the setting. Consequently, this behavior setting constancy changes the environment for the inhabitants. In general, the research tends to support this notion.

Summary

The basic rationale for Barker's theory is that behavior settings tend to select and to influence the behavior of people who inhabit them. To operationalize the theory and assess and describe behavior settings, Barker (1968) and others have developed the Behavior Setting Survey. According to the theory, there is an association between the number of people in a behavior setting and the frequency, intensity, origin, and termination of forces that impinge upon these people. Thus, a behavior setting may be undermanned, optimally manned, or overmanned depending upon the number of inhabitants available to perform the essential functions. The theory proposes that there are differences between undermanned settings and optimally manned settings. Undermanned settings have fewer inhabitants but the same standing patterns. Thus, setting functions are threatened, and the people sense the possibility of losing the satisfactions the setting provides. Therefore, the inhabitants are involved in more actions, stronger actions, and more varied actions. The people tend to be busier, more vigorous, more versatile, and more involved in the setting.

Research

Research findings from a variety of institutions, as noted by Willems (1964b), have implications for behavior-setting theory. Consequently, the studies reported here in the two research sections are drawn from organization settings, work situations, group meetings, community settings, and high school and college settings. The reviews by Barker (1968), Indik (1963), Porter and Lawler (1965), Thomas and Fink (1963), and Willems (1964b) were determined to be quite helpful in completing the present work. The first research section reviews research directly testing theoretical predictions. The second research section reviews other relevant research indirectly testing behavior-setting theory. In both sections the focus is on the effects of the size of the setting upon the behavior of individuals.

Research Directly Testing Theoretical Predictions

Responsibility, social transaction, and familiarity. Thirteen studies (given below) have investigated these variables. In general, the research indicates that people of undermanned settings, compared with people of optimally manned settings, function in positions of responsibility and importance more frequently and in a wider range of activities. Further, the findings indicate that people in undermanned settings engage in more greeting and social interactions per person. Finally, evidence suggests that people in smaller settings are more familiar with their behavior settings.

In a series of comparative studies (Barker, 1960, 1961, 1963; Barker & Barker, 1961) the Barkers investigated the psychological ecology in America and England. The two towns compared were Midwest, Kansas, and Yoredale, England. Both towns are rural distribution centers comparable in industry, governmental institutions, and proximity to cities. Midwest has a population of 715 and Yoredale a population of 1,300. In the initial study, Barker (1960) found that Yoredale had more inhabitants per behavior setting than did Midwest. He also determined in comparing Yoredale and Midwest that the inhabitants of the English town spent fewer hours per person per week in behavior settings. Furthermore, he found that a higher percentage of the town's (Yoredale) behavior settings were segregated with regard to age and social class and that fewer behavior settings depended upon children and adolescents for their functioning. However, Barker and Barker (1961) in comparing the children of the two towns found that Midwest's children participated in a wider range of activities, filled essential positions in more settings, and were excluded from fewer settings. In other studies Barker (1961, 1963) focused on the place of old people in the two community systems. Old age was defined as beginning at 65 in both Midwest and Yoredale. Here he found that the old people of Midwest, in comparison with the old people of Yoredale, participated in a wider range of activities, were more involved, and participated for longer periods of time. Thus, the Barkers suggested that in Midwest, people in general are in shorter supply and in greater demand than in Yoredale. Consequently, the average person is functionally more important to various behavior settings.

In another study Barker (1964) was concerned with the extent to which adolescents were responsible participants in public, nonschool behavior settings of four towns and two cities. The findings showed that the community activities were more frequent for the small-school/small-town adolescents than for the large-school/city adolescents. In general, the small communities provided positions of functional importance for adolescents more frequently than did the cities. The findings were similar for a variety of nonclass school settings (Gump & Friesen, 1964a). The second part of this investigation (Barker, 1964) was concerned with whether or not the findings for nonclass activities would hold for classroom activities. The evidence indicated that, as was true with the nonclass settings, the school students participated in fewer classes and varieties of classes than the

small-school students despite the fact that the large schools had a greater number and variety of educational behavior settings than the small schools.

The objective of a study by Wicker (1968) was to investigate the relationship between size of high school and student behaviors and subjective experiences in school extracurricular activities. Juniors from one large school and four small schools rated their experiences on experience rating scales in six kinds of school extracurricular activities (e.g., basketball games, dances). Subjects were matched for sex, social class, and mental ability. Comparisons between and within large and small schools indicated that experiences such as being needed, feeling challenged, having an important job, and developing self-confidence were associated with undermanned activities.

Wicker (1969b) also tested the generality of the findings supporting behavior-setting theory by investigating churches differing in number of members. Subjects in this study were middle-aged adults. The large and small churches were located in the same urban area. A comparison of members of a small church (338 members, sample N = 30) and members of a large church (1,599 members, sample N = 34) showed that the former participated in more different kinds of activities, had more leadership positions, and spent more time in the activities. Furthermore, members of the small church attended church more often, contributed more money, and were more approving of high levels of support for church activities. In general, the findings supported Barker's behavior-setting theory.

Wright (1961) investigated the variables of social transactions and familiarity with the setting. Here, in terms of social transactions, Wright determined that children in the small town initiated more greetings to other persons, experienced more greetings from others, and in general were more involved in interpersonal transactions. Similarly, he found that children of small towns were more familiar with objects and people in their behavior settings.

Voluntary participation. Six empirical studies (given below) have investigated the relationship between setting size and participation in various activities. The results of these studies indicate a negative association between size of setting and participation in the setting. In general, the research suggested that people in undermanned settings participate voluntarily more frequently in activities of the setting than do people in optimally manned settings.

Three studies, as reported by Willems (1964b), have suggested a negative relationship between participation and setting size. Larson (1949) related size of high school to students' activities. He determined that higher percentages of students in large schools reported that they engaged in no activities or only one and that they experienced difficulty in getting into activities. LeCompte and Barker (1960) found a negative relationship between setting size and Rotary Club attendance, Sunday School attendance, and participation in high school music festivals. Wright (1961), in another study, showed that children in small towns re-enter settings more often

and spend more time in the community settings. In addition, he found that children in small towns find more of the same persons using the settings they enter.

Barker and Hall (1964), in a particularly significant study, investigated the problem of school size and student behavior. Data were available on 218 high schools. The results showed that students who participated in district music, drama, journalism, and student government competitions reached a peak in high schools with enrollments between 61 and 150. The proportion of participants was 3 to 20 times as great in the smallest schools as in the largest schools. Furthermore, the investigators determined that the average number of extracurricular activities and kinds of activities in which students participated during their 4-year high school careers was twice as great in the small as in the large schools. The above findings suggest that if versatility of experience is sought rather than opportunity for specialization, a smaller school is more effective than a larger one. However, if specialization is desired, the larger school will probably be more effective.

Baird (1969) in a pair of studies examined the nonacademic and academic participation and achievement of students from large and small high schools. The first study investigated the relationship between high school nonacademic accomplishment and high school size. A sample of 21,371 students was used. Measures of student achievement included the ACT Composite Score, high school grades, nonacademic achievement scales (leadership, music, drama and speech, art, writing, and science), and plans for extracurricular participation in college. The responses of students were grouped according to the size of their graduating class as follows: less than 25, 25 to 99, 100 to 399, and more than 400. Furthermore, the data were grouped into four types of home community as follows: farm or open country, small town or city (less than 50,000 population), suburban areas, and central city (over 50,000). Students from small schools were found to participate in a variety of areas to a greater extent than students from large schools. This finding was especially pronounced in the areas of leadership and speech and drama.

The second study explored the long-term effects of size by comparing students from large and small high schools on records of accomplishment in college. Data for this study came from follow-up information obtained in 1965 at the end of the students' sophomore year in college. The original survey (American College Survey) was administered to these students during their freshman year of college. The total sample included 2,289 men and 2,834 women attending 29 colleges. The findings of this study showed no large differences in the college achievements of students from large and small high schools. However, in general, college achievement seemed negatively related to college size.

Cognitive complexity, forces toward participation, and satisfaction. Little research has been conducted in these three areas. Wicker (1969a) examined the hypothesis that cognitive complexity is a function of frequency and intensity of interaction in behavior settings. The subjects were 40 juniors from a large high school and 40 [illegible]rs from small high schools. The subjects were matched on the variables of

intelligence and social class. A modified Role Construct Repertory Test on which subjects responded to triads of school behavior settings was the cognitive complexity measure. The findings showed that small-school students not only entered a wider range of school behavior settings and had more performances in the settings in comparison to the large-school students but also had higher cognitive complexity scores.

In two studies 4 years apart, Willems (1964a, 1966, 1967) investigated high school students' obligation to nonclass school activities. The activities included in these studies were voluntary. In 1961 (N = 40) and 1965 (N = 80), samples of marginal (poorly suited) and regular (better-suited) students in small and large schools were interviewed concerning reasons for or pulls toward attending certain nonclass activities. The procedure for selecting marginal and regular junior students was the same for both studies. Subjects included in the marginal samples met the following criteria: IQ below 99, two grades of D the previous semester, father in a nonprofessional and nonmanagerial occupation, father who did not finish grade 10, and mother who did not finish grade 12. The subjects included in the regular samples had IQs above 105, no grades lower than C the previous semester, father and mother who finished grades 10 and 12. The findings showed that in the small schools the marginal students reported a sense of obligation which was similar in magnitude to their regular schoolmates. In the large school the marginal students reported little sense of obligation. In essence, the small-school marginal students were not experientially and behaviorally marginal, while their large-school counterparts were a group of relative outsiders.

Gump and Friesen (1964b) tested the prediction that small and large high school juniors would report different kinds of satisfaction from their experiences in the behavior settings they inhabited. Large and small high school juniors were matched on variables of sex, IQ, and race. Subjects were asked to report what their participation in settings had meant to them. The prediction was confirmed. Specifically, juniors from the small schools reported more satisfactions related to the development of competence, to being challenged, to engaging in important actions, to being involved in group activities, and to achieving moral and cultural values. Large-school juniors reported more satisfactions dealing with vicarious enjoyment, with large entity affiliation, with learning about their school's persons and affairs, and with gaining points by participation.

Other Relevant Research

Responsibility. A small amount of related research in this area has explored bystander intervention in emergency situations (Darley & Latane, 1968a). Subjects in an experiment overheard an epileptic seizure and believed either that they alone heard the emergency or that one or four unseen others were also present. The findings showed that the presence of other bystanders reduced the individual's feeling of personal responsibility and lowered his speed of reporting. Furthermore, these investigators' (Latane & Darley, 1970) findings suggested that the smaller the

size of the community in which the subject grew up, the more likely he was to help the person in the emergency ($r = .26$, $p < .05$). Most of the subjects came from towns in and around New York; therefore, the authors were surprised to find any correlation at all. In general, the results of this work suggest that the more people who watch a person in distress, the less likely someone will help (Darley & Latane, 1968b; Latane & Rodin, 1969).

Voluntary participation. The research in this area indicates a negative relationship between setting size and participation in the setting. Five studies have all demonstrated that smaller settings tended to have higher rates of voluntary participation. Dawe (1934) discovered that increase in size of groups led to decreased percentage of children (kindergarten level) who participated in the discussion, decreased total amount of discussion, and decreased average number of remarks per child. Fisher (1953), in an analysis of the primary group using male graduate students, determined that as these groups increased in size they met less frequently. Also, Bales et al. (1951) determined that the frequency of participation of individuals in groups, on the average, decreases with increased size. Again in high schools, Coleman (1961) found the percentage of males who participated in football to be negatively related to size of school. Finally, Indik (1965) determined organizational size to be significantly negatively related to member participation.

Satisfaction. The research findings suggest that people working or interacting in small or undermanned settings tend to report more satisfaction in comparison with people in large settings. But two studies (Ziller, 1957; Miller, 1952) failed to find a relationship between satisfaction and size of setting. It is possible, as suggested by Gump and Friesen (1964b), that the patterns of satisfaction may be different for small and large behavior settings.

The findings of eight other studies suggest that satisfaction decreases as the size of the setting increases. Campbell (1952) investigated the effect of a group payment scheme. He reported that as the size of the group increased, the workers who did not understand the scheme became progressively less satisfied with the scheme. Hare (1952) studied the influence of group size on satisfaction with discussion. His sample included 150 Boy Scouts. The Scouts were divided into 9 groups of 5 boys and 9 groups of 12 boys. The topic for discussion was a story about a camping trip which ended in misfortune so that it was necessary for each boy to find his way back to civilization alone. Hare determined that there were more persons in larger groups who were dissatisfied with group discussions compared with smaller groups. In addition, he found in the larger groups that there was less consensus about discussion issues, fewer members changed toward the consensus, and the members felt less often that they had enough time for discussion. The sample in Slater's (1958) study consisted of 24 groups ranging from 2 to 7 men with 4 groups of each size. He discovered on a postexperimental questionnaire that the participants in small groups reported higher positive satisfactions than did the members of larger groups. The subjects readily verbalized the disadvantages of the larger groups. Group participants were perceived as too aggressive, impulsive, competitive, and

inconsiderate. The group itself was seen as too hierarchical and centralized. Indik (1961) measured the amount of intrinsic job satisfaction expressed by workers in 32 package delivery departments varying in size from 15 to 61. Indik's findings showed that increased size led to lower satisfaction. Katzell, Barrett, and Parker (1961) determined a significant trend for workers in large warehouses to express lower job satisfaction than that expressed by workers in small warehouses (23 out of 23 correlations were in this direction). Kerr, Koppelmeier, and Sullivan (1951) reported that for 894 workers in 29 departments in two electronic plants, job satisfaction was correlated negatively (−.46) with size of department. The final two studies (Katz, 1949; Talacchi, 1960) both discovered that employees in small work groups were more satisfied than those in large work groups.

Absenteeism, punctuality, and interest. Research studying primary work groups, business departments, and factories suggests that people working in small settings in comparison with people in large settings are absent less often. Eight of 10 studies indicated a positive linear relationship between absenteeism and the size of the group. Two studies (Acton Society Trust, 1953; Revans, 1958) have investigated employee punctuality and involvement in the affairs of the setting. Both studies found that employee punctuality and interest tend to decrease as the size of the setting increases.

Revans (1958) has provided a thorough review of findings from British data on the effects of size in relation to absenteeism. He reported that in five gas works ranging in size from 67 to 3,340 employees, the duration of absence due to accidents and the size of the works were highly related ($r = .91$). Furthermore, size of works was shown to be related to absenteeism due to sickness and other factors ($r = .62$). In general, Revans determined that absenteeism was positively correlated with size.

The Acton Society Trust (1953) studies set out to investigate morale as related to size, using various behavioral and attitudinal variables as measures of morale. Absenteeism was found to be positively correlated with size. The results showed a correlation of .44 between size of factory (ranging from under 100 employees to over 1,000) and absenteeism.

Baumgartel and Sobol (1959) tested the prediction that the larger the size of the plant the higher the absenteeism. Data on absenteeism were collected for all nonsupervisory employees of a major airline. Two measures of absenteeism were used: the number of days lost during the year and the number of times absent during the year. The findings indicated that absenteeism was higher in larger units.

Talacchi (1960) studied the kind of employee behavior and level of satisfaction associated with size differences. The sample was composed of 93 industrial organizations. A measure of employee satisfaction for each organization was obtained by the Employee Inventory. In all 93 organizations, negative correlations were found between size and satisfaction and between satisfaction and absenteeism. Talacchi concluded that increasing size leads to increased division of labor, job

specialization, and status differentiation. Thus, this outcome leads to decreased satisfaction and to avoidance via absenteeism and turnover.

Three other studies (Hewitt & Parfit, 1953; Indik & Seashore, 1961; Kerr, Koppelmeier, & Sullivan, 1951) have all shown that larger departments of a company have higher absenteeism rates. Hewitt and Parfit studied a factory of 1,000 employees and found a positive correlation between size of work unit and rates of nonsickness absence. The sample in the Kerr, Koppelmeier, and Sullivan study included 894 workers in 29 departments. Finally, the sample in the Indik and Seashore investigation included 32 package delivery departments, varying in size from 15 to 61.

Two of the 10 studies concerned with size and absenteeism did not show a positive relationship between these two variables. Metzner and Mann (1953) found a correlation in the expected direction between absenteeism and work group size for white-collar workers, but this result was not significant. However, they did find that among blue-collar workers small work groups (7 and under) had fewer absences than did large work groups (over 7). Argyle, Gardner, and Cioffi (1958) studied 90 working groups with foremen in eight British factories. They revealed a curvilinear relationship between absenteeism and work group size with the lowest absence rates occurring in the middle-sized groups.

Productivity. Studies investigating the relationship between productivity and size are not conclusive. The available evidence does not completely support the hypothesis that small units are more productive than large units.

Four studies reported a negative relationship between productivity and size. Such a relationship indicates that production decreases as size increases. Marriott (1949) used two automobile factories to investigate the relationship between size and output. The sample was composed of males involved in direct production work. His findings indicated a negative correlation between output and size of working group. The smaller-sized groups showed consistently larger output in each factory. Katzell, Barrett, and Parker (1961) collected data on employee job performance and situational characteristics in 72 comparable warehousing divisions of a company. The warehouses had a mean of 35 production workers each, with a range from 13 to 83. They reported that product value, productivity, and profitability were all lower in the large divisions of the company studied. The Acton Society Trust studies (1953) also determined output to be negatively related to size. Finally, Thomas (1959) studied 83 county welfare bureaus. He reported a negative relationship between worker performance and size of working group.

Two studies indicated a curvilinear relationship between productivity and size. A curvilinear relationship suggests that the middle-sized groups tend to be the most productive. Herbst (1957) explored the use of input, size, and output in the measurement of behavior structures (human organizations). His data showed a curvilinear relationship between size of organization and output, with the middle-sized units performing best. Revans (1958) reported that data collected by the

National Coal Board in Britain for the years 1948-53 showed a curvilinear relationship between mine size and output per mine. The highest output again was obtained in the middle-sized mines.

One study showed a positive relationship between performance and size. Gekoski (1952) investigated 21 groups of female clerical workers. The groups ranged in size from 4 to 18 members and involved 200 persons. The results showed a nonsignificant positive relationship between individual productivity and size of work group.

Group cohesiveness. In general, the evidence indicated a negative relationship between group cohesiveness and size of the setting. The people of small or undermanned settings, in comparison with people of large settings, tended to exhibit more group cohesiveness. In addition, people of undermanned settings more frequently report liking other setting members.

Five studies have investigated this variable. Hemphill (1956), as reported by Porter and Lawler (1965), determined that small groups were more often characterized by attitudes of high intimacy. Specific behaviors include the frequency of laughter, the pleasant anticipation of group meetings, and the absence of griping and complaining. Smigel (1956) examined the attitudes toward stealing from each of three categories of organizations: small business, large business, and government. Smigel found that most individuals would prefer to steal from and would be more approving of others stealing from large, impersonal organizations than from small, personal organizations. Katz (1949) observed in various industrial organizations that higher group cohesion developed in smaller organizations. Similarly, Miller (1952) discovered a high negative correlation between size and group cohesiveness. Group cohesion was defined in terms of group unity, belonging to the group, group acceptance, and group helpfulness. Larson (1949) related size of high school to students' relationships to peers. His results showed that a higher percentage of students in small schools in comparison with large schools reported that it was easy to make friends and that they liked their friends.

Academic ability and achievement. Studies investigating the relationship between academic ability and setting size are not conclusive. Some of the studies suggest a positive relationship between these two variables, some a negative relationship, and others no relationship. Thus, the available evidence does not support the hypothesis that individuals from smaller settings exhibit higher ability for academic work. It is very possible that factors other than size influence the differences in lack of achievement of students.

Four studies reported a positive relationship between ability for academic work and setting size. Street, Powell, and Hamblen (1962) examined the relationship between performance of students on standardized achievement tests and the size of the schools which they attended in a mining and a rural area of eastern Kentucky. The Stanford Achievement Tests were used to measure achievement in the seventh and

eighth grades. The schools in each area were classified by number enrolled into one of three groups: 300 or more, 100-299, and less than 100. The findings suggested that larger schools tend to produce higher achievement levels among students.

Three other studies (Feder, 1940; Pettengill, 1934; Stalnaker & Remmers, 1931) all indicated a positive relationship between ability for college work and setting size. The results of these studies showed that the graduates of large high schools had higher aptitude scores than the graduates of smaller schools.

Three studies revealed no relationship between ability and setting size. Alexander and Woodruff (1940) reported a faculty survey of the University of New Hampshire freshman class of 1938. The author reported no differences in scholastic aptitude among the graduates from various-sized high schools. However, no tests of significance were conducted. Gray (1950) reported no differences in mean high school rank scores for students from high schools of different sizes. Hoyt (1959) studied entering freshmen at Kansas State University in the fall of 1956. A total of 598 men and 286 women was included in the sample. The sample was subdivided according to the size of the high school graduating class from which the students came. The American Council on Education Psychological Examination (ACE) had been administered to all the students. The findings showed no differences in mean ACE scores for students from high schools of different sizes.

One study suggested a negative relationship between ability and/or high school rank and setting size. Hoyt (1959) further determined that males from small high schools tended to earn higher high school ranks on the average than those earned by students from larger schools. However, there was a trend for students from smaller high schools to receive lower grades at college when these grades were adjusted for high school rank.

Centralization and social interaction. The reviews and research findings indicate that people of small settings, in comparison with people of large settings, evidence less centralization of communication around one or a few persons. The relationship between centralization of communication and size of setting is positive. However, the results suggest a negative relationship between social interaction and size of setting. The people in smaller settings show greater frequency of social interaction.

Two reviews of the literature have focused on group size and centralization and social interaction. Kelley and Thibaut (1954) summarized the literature on the experimental investigation of problem solving by small groups. They concluded that with increasing size of groups, the most active members become increasingly differentiated from the rest of the group. Furthermore, on the range from two to seven, there appears to be an increase in the proportion of the group who are under-contributors to the problem-solving task. In another review Bales (1952) focused on the communication patterns in small experimental groups. Bales reported that the top man in groups larger than five tended to speak considerably more to the group

as a whole than to specific individuals in the group. In essence, the communication pattern tends to centralize.

Six other studies have all reported that the size of the setting tends to be positively related to centralization and negatively related to social interaction. Bales and Borgatta (1955) and Miller (1952) found a high negative correlation between size and opportunities to talk in a discussion group. Indik (1961), as reported in Willems (1964b), determined that the size of 96 business organizations correlated negatively with the maintenance of communication among members. These findings indicated that greater size led to difficulty in communication. Terrien (1959) analyzed organizations with as few as 10 employees to as many as 4,624. He determined that for an individual to maintain the same level of interaction with all members as size increases, it takes much more time and interaction. Furthermore, he showed that familiarity with others tends to decrease as size increases. Likewise, Taylor and Faust (1952) reported greater centralization of activity around a leader as size increased. Finally, Baumgartel (1957) revealed that familiarity with others tends to decrease as size of laboratory increases.

Easier communication. In this area the limited research suggests a negative relationship between ease of communication and size of the setting. Campbell (1952) examined the incentive effect of a group payment scheme in relation to the size of the group. He organized the workers in two factories into different-sized groups, ranging from under 20 men to over 100. Campbell determined that as size of group increased, the percentage of workers understanding the payment scheme decreased. Furthermore, it was determined that workers who did not understand the scheme became progressively less satisfied with it. Indik (1961) in his study of 96 business organizations found that increased size led to difficulty in communication, less attraction to the organization, and less participation.

Leadership and identifying outstanding persons. Evidence from one study suggests that a negative relationship exists between leadership behaviors and the size of the setting. Bass and Norton (1951) studied leaderless discussion participants in groups of 2, 4, 5, 8, and 12. Each group participated in a 30-minute discussion. Two trained observers rated participants in group discussions in terms of leadership ability demonstrated by their group participation. The findings showed a significant decline in the mean leadership assessment earned by participants as the groups studied became larger in size. Outside observers rated members of large groups as less active, less responsible, less effective, and less influential than members of small groups.

Coleman (1961) investigated the ability of students to identify outstanding persons and their agreement about such persons. He found a negative relationship between size of high school and the ability to name an outstanding fellow student in certain areas. A similar negative relationship was obtained between size of school and consensus about persons in the student body who were outstanding in various areas.

Importance to settings and turnover. One study and a review suggest there is a negative relationship between the inhabitant's importance to the setting and size of the setting. Thibaut and Kelley (1959) reviewed laboratory studies of groups. They suggested that as the group becomes smaller, its identity seems to become more dependent on maintaining each one of its members. Katz (1949) found in various industrial organizations that individual workers in small groups assumed more importance and reported more satisfaction. The limited research suggests that people of small settings, in comparison to people of large settings, tend to be more important to behavior settings.

Two studies have investigated the variable of employee or student turnover. Both studies determined that turnover is greater in large units as compared with small units. Cleland (1955) hypothesized that quitting and beginning jobs would be negatively related to the size of industrial plants. However, he found the reverse to be true. Less turnover was found to be associated with small plants. Talacchi (1960) concluded that increasing size leads to increased division of labor, decreased satisfaction, and avoidance via absenteeism and turnover.

Value, meaning, and role conceptions. Two studies suggest an inverse relationship between the value and meaning of participation in setting activities and size of setting. The few available findings suggest that people in small settings report more often that participation is valuable, useful, and meaningful. Anderson, Ladd, and Smith (1954), as reported in Willems (1964b), investigated 2,500 high school graduates. They found that the percentage of graduates who reported their participation in extracurricular activities as valuable and useful was inversely correlated with the size of the school. Worthy (1950) reported research work conducted at Sears, Roebuck, and Company on employee morale. Their surveys have covered over 100,000 employees working in several hundred company units. Worthy concluded that attraction to the organization and morale are negatively related to size. The smaller the unit, the higher the morale. The findings suggest that in small units the employee's work becomes more meaningful to him or her.

Three studies have reported a negative relationship between role conception and setting size. Thomas (1959) in his study of 83 county welfare bureaus revealed the size of the bureaus to be negatively related to the agreement among workers and supervisors on roles of social workers. Furthermore, he found a negative relationship between size of the bureaus and the number of activities seen as part of the social worker's role. Likewise, Parsons, Bales, and Shils (1953) and Simmel (1902) pointed out that there is a tendency toward specialization of roles and increased division of labor as organizational size increases.

Summary

The results reported to this point in time give substantial support to behavior-setting theory. The evidence indicates that behavior settings do influence the behavior of their inhabitants. Just as persons structure psychological plans which

regulate their behavior, their everyday environments also have plans for them (Willems, 1965). In summary, the above studies and reviews directly and indirectly testing behavior-setting theory suggest relevant behavioral differences between the inhabitants of small behavior settings and the inhabitants of large settings. Inhabitants of small behavior settings differ in the following ways:

1. They function in a wider range of activities, assume positions of responsibility and importance more frequently, engage in more social greetings, and are more familiar with their setting.
2. They participate voluntarily more frequently.
3. They are more satisfied.
4. They report more forces toward participation in behavior settings.
5. They are absent less often, more punctual, more interested in the affairs of the behavior setting, and more productive.
6. They exhibit more group cohesiveness.
7. They evidence less centralization of communication, increased ease in communication, and greater social interaction among inhabitants.
8. They demonstrate more leadership behaviors and exhibit greater ability to identify outstanding persons.
9. They tend to be more important to behavior settings and exhibit less turnover.
10. They show evidence of broader role conceptions and seem to be more cognitively complex.
11. They report more frequently on participation as having been meaningful.

Evaluation

The theory allows one to generate predictions from behavior settings to behavior. However, these behavioral predictions are within the bounds of a standing pattern of a behavior setting, and limitations do exist. Barker (1968) noted that only overt behavior can be predicted from the behavior settings. Motives and experiences of inhabitants cannot be predicted.

A potential problem inherent in behavior-setting research is related to the sampling unit. Barker (1968) refers to behavior settings with fewer than optimal inhabitants

as undermanned behavior settings. The research completed by Barker and his colleagues has used this concept to identify existing research samples. However, related research, particularly in the area of organizational research, frequently refers to the sampling unit as a small unit or small group. It is quite possible that a small unit or small group is not undermanned according to Barker's definition. Similarly, it is possible that a large unit or large group may be overmanned rather than optimally manned. Barker does not discuss the implications of an overmanned behavior setting. In any event, the various sampling units used in studies drawn upon to support behavior-setting theory may not be consistently defined.

In regard to the concept of learning, Barker (1968) indicates that the characteristics of behavior settings are perceived and suggest certain kinds of behavior to participants. Thus, it seems that an individual is expected to accumulate knowledge about a behavior setting and, then, to implement behaviors that are to some extent acceptable in the setting. However, the significance of learning seems to decline after an individual has accumulated knowledge about the environment or behavior setting. Actually, whether or not this is the case may depend upon the nature of the behavior setting.

Behavior-setting theory also considers the concept of change. Barker (1968) indicates that if the properties of a setting change (undermanned or optimally manned), the schedule of the environment's inputs will change for the inhabitants. In other words, if the number of inhabitants in the setting is varied, the behavior of the remaining inhabitants will be affected. However, individual change or personal growth is not discussed by Barker.

In regard to the more formal characteristics, the theory logically includes within its frame of reference research findings from a variety of institutions. Relevant, related research has been drawn from organizational settings, work environments, group meetings, and community, high school, and college settings. Practically all of the studies discovered and reported in the review section are in general agreement with the theory. Furthermore, the theory seems to be of a heuristic value in stimulating relevant research in an attempt to support and generalize the theory. Recent research in the areas of community, high school, and to a limited extent college settings gives substantial support to the behavior-setting theory. However, additional research needs to be conducted in organizational work settings and in college settings in order to generalize the theory to these environments.

The concepts of this theory are operationally defined by means of the Behavior Setting Survey (BSS). Data available indicate that the survey is adequate but that the process involved in actual data collection is elaborate and complex. For example, data collection frequently involves the use of different sources (records, publications, and information). In addition, accuracy or validity of the data must be assessed by using multiple information sources and cross-checking against other variables. In essence, the BSS seems to be an effective measure of the behavioral environment. However, the survey does not attempt to assess the perceived

environment. Consequently, little information is available on how a behavior setting is perceived or reacted to by participants. Of additional interest is the fact that the theory does not operationally define the individual. In fact, the theory has no conception of the individual. The focus of the theory and its operational definition is on the environment and the effect of the environment upon behavior. Environments shape the behavior of people who inhabit them.

Barker's approach is one of the most systematic which has appeared. The theory is elaborately developed which makes it a difficult approach to summarize. Furthermore, the thoroughness and detail make it interesting but, at the same time, frustrating to read. The basic assumptions are simple and understandable, but their elaboration is amazingly complex. Many new terms are introduced. These include structural, dynamic, circumjacent, synomorphic, penetration, performance zone, action patterns, etc. It is difficult to keep all the new concepts and terms in mind while reading about the development and application of the theory.

The theory is logically sound. However, it will probably attract few followers because of the formidability of the concepts and the detail. In spite of the variables available for study, the published material has focused primarily on population size in making inferences from behavior settings to their inhabitants and vice versa. Thus, a need exists to broaden the base of the theory by exploring other variables (personality, motives, experiences, and behaviors) that will permit inferences to be drawn from settings to people and people to settings.

Implications for Theory, Research, and Application

Theoretical Implications

In the past some psychologists (Brunswik, 1955; Lewin, 1951) have assumed that environmental variables occur independently of the human behavior of the environment. However, according to behavior-setting theory, the environment of human behavior and its inhabitants are not independent. Rather, the environment consists of nonhuman components, human components, and control mechanisms that moderate the components in predictable ways to maintain the environmental entities in their characteristic states. Thus, the same environment provides different inputs to different persons; and if the individual's behavior changes, different inputs to the same person. Furthermore, if the properties change (undermanned or overmanned environment), the schedule or program of the environment's inputs will change (Barker, 1968).

Behavior-setting theory also suggests that the behavior of the inhabitants of a setting is less varied than their behavior across all the settings they inhabit. However, individual behavioral variation and individual differences are not eliminated by restricting behavior to a given setting. Behavior-setting programs tually require individual variation and differences within the settings. Thus,

behavior settings require conformity of their inhabitants, but they do not require uniformity (Barker, 1968).

An additional theoretical implication suggested by Barker (1968) is that if we can identify the common motivational and cognitive processes of the inhabitants of a behavior setting and the common perception of the input of the settings and further, if we can identify the motivational and cognitive product of the interaction of the above two variables, then perhaps one may make a probabilistic prediction of the motives and experiences of the inhabitants. Thus, if we know something about the motives and cognitive processes of the people in a setting, their perception of the input of the setting, and the product from the interaction, we may be able to predict some of the more common behaviors in the setting. This implication suggests the need for a concept and an operational definition of man. To Barker (1968), different behavior settings have variable inputs to their inhabitants. In addition, the inhabitants of settings have common motivational and cognitive processes. Thus, the possibility exists that the motives, experiences, and behavior of the inhabitants of different settings differ in predictable ways.

Implications for Research

Of significance is the fact that Barker's ecological orientation suggests a point of view about the way research is to be conducted. According to Barker (1968), there are two types of data-generating methods to study psychological phenomena. In one type, the psychologist functions as a transducer and produces T data. Psychological phenomena are scanned by the psychologist and transformed according to coding categories into data. Psychological phenomena dominate this data-generating system. The psychologist is a receiver, coder, and transmitter. Transformations are the only contribution to the data of the system the psychologist has made. Thus, this system produces data that denote a world the psychologist did not make. Ecological psychology is a transducer science. Its data are the record of behavior and its conditions in the natural environment.

The second type of data-generating system is dominated by the psychologist. He functions as an operator and a transducer. In this system, the psychologist achieves control which permits him to focus on specific areas of concern to him through data that refer to events that he, in part, creates. This system is referred to as an operator data system or O data system. In essence, these are experimental methods. The psychologist is investigating what goes on under the conditions he has arranged. The two systems are presented in Figure 1.

In this ecological frame of reference, Gump and Barker (1964) suggest three ways that behavior settings can enter research. First, behavior settings can be used as sampling units. If an administrator wants to test the adequacy of behavior settings, he might wish to know what happens in one kind of school or college as compared with another. Second, the number, kind, and organization of settings can be viewed as groups of dependent variables. For example, what happens to college activity

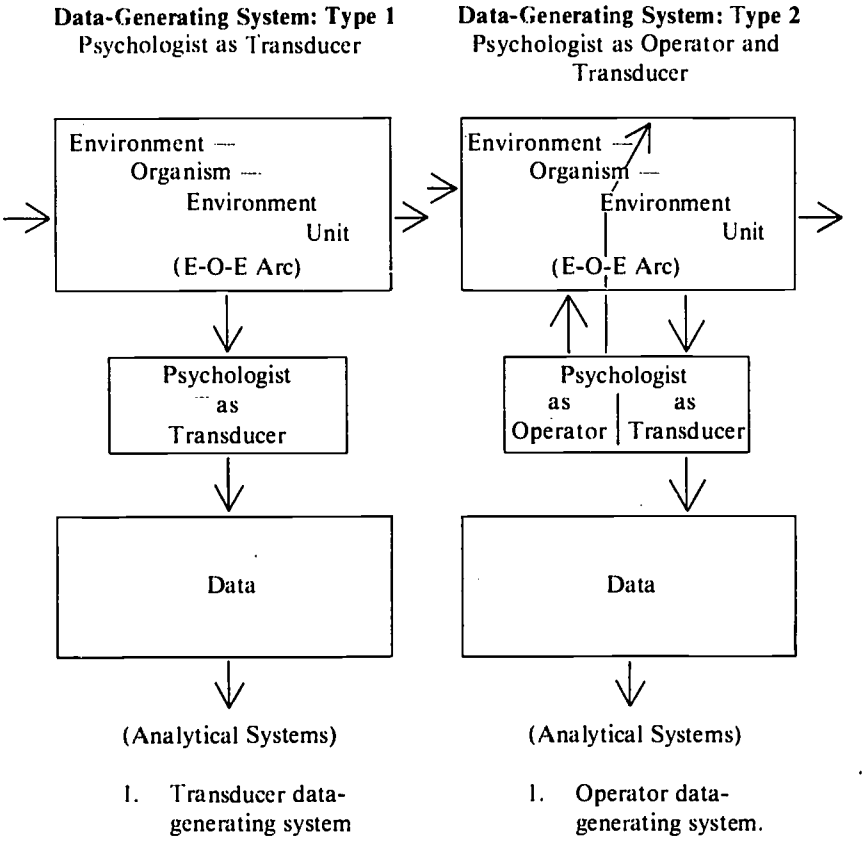

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Fig. 1. Data-generating systems.

settings when a large percentage of the students commute to the campus? How do secular versus religious, public versus private, American versus European schools and colleges differ in the number, kind, and interaction of settings? The third possibility is that behavior settings can be used as the independent variables. This type of study investigates the response of the people of behavior settings to the settings. There seem to be other characteristics of settings influencing behavior besides size or population. Some of these would seem to be performance ements, types of motivation demanded, and characteristics of the individuals etting.

Applied Implications

A practical implication of the theory involves the regulation of behavior settings. In small schools and probably in small colleges with relatively few inhabitants in settings, regulation seems to occur by deviation-countering feedback. Thus, the inhabitants or students themselves take action to correct or to change the problem conditions. Research has shown that in such undermanned environments there is a press on students marginal to the setting to participate to maintain the stability of the setting. To eliminate students would make it more difficult to maintain the setting at an adequate level. Thus, in small schools or colleges where manpower is needed, new students would be expected to be drawn into activities more rapidly than would be the case in large institutions.

In large schools and no doubt in large colleges with relatively many students, regulation seems to occur by means of discrimination, deviation-countering feedback, and vetoing feedback. Initially, students with desirable potential behavior or ability in a given area (such as basketball) are identified. Then, deviation-countering feedback is provided to the students exhibiting potential. However, no feedback or vetoing feedback is provided to most of the students who lack promise. Essentially, many students marginal to the setting in large environments tend to become an isolated group with no pressure to perform or no pressure against failure to perform.

In general, research and behavior-setting theory posit a negative relationship between school size and individual participation. Gump and Barker (1964) suggest that a school should be small enough that all or most of its students are needed in its business. "A school should be small enough that students are not redundant." However, the question of size remains a difficult one mainly because there are other variables to be considered, for example, the individual's needs and specific goals. As pointed out by Gump and Barker, if versatility of experience is preferred, a smaller school would seem to be more effective than a larger one. However, if specialization is the objective, the larger school or college is probably the more effective one.

Another applied implication of the theory involves the lasting effects of school size or the transfer of nonacademic and academic participation from high school to college. Baird (1969), in a study mentioned previously, found that the higher rate of participation and achievement in small schools does not seem to transfer to the college years. Students from high schools of different size did not vary significantly on plans for continued achievement, on actual college accomplishment, and on scales of potential and competency. However, in a small sample of colleges, Baird did find that college achievement was related to college size. This finding tends to support behavior-setting theory and further indicates the importance of the immediate situation. Other research tends to support the above finding. Feldman and Newcomb (1969), in their review of research on the impacts of college, suggested that the conditions for college impacts seem to be most frequently provided in small residential 4-year colleges. Astin (1968) in a study of 246

institutions determined that when comparing the large institutions with the small institutions, there was greater competitiveness, less cohesiveness, less familiarity with the faculty, less involvement in class, and little concern for the individual student in the large institutions. However, some small colleges also exhibited this pattern while some large ones did not. In another study, Panos and Astin (1968) found that students are more likely to complete 4 years of college if they attend colleges where student peer relations are characterized by friendliness, cooperativeness, and independence. The authors further determined that these colleges show concern for the individual student, that their policies concerning student aggression are relatively permissive, and that their students tend to be more involved in college activities. Pace (1967) in a study found size to be negatively correlated with the degree to which the campus is perceived by the students to be friendly, cohesive, and group oriented (as measured by the Community Scale of the College and University Environmental Scales, Pace & Pace, 1965). In two other studies, Astin (1963a, 1963b) found that size has a negative effect on students' plans to pursue a PhD. Also, Astin determined that size was negatively correlated with the student ratings of the amount of faculty-student contact, time spent by students in the library, and quality of teaching. Size was determined to be positively related to getting a degree rather than learning per se, becoming concerned about appearance, and faculty resentment of students' criticisms. In general, these findings suggest that the size of the college will probably have an impact on the effectiveness of the educational process.

In the academic area, more narrowly defined, recent research suggests that the size of high school graduating class is not related to freshman year quality-point ratio. Hoyt (1959) divided his sample into five groups according to the size of the high school graduating class from which the students came. Hoyt reported that first-year college grades were at about the same level for students from the various-sized high schools. He further suggested that institutional differences may be a relevant variable. Aiken (1964) also investigated this area by dividing women students from North Carolina public high schools completing their freshman year at the Women's College into seven groups according to the size of their high school graduating class. The medians for the seven class sizes were 39, 78, 120, 153, 231, 411, and 500. The results of the study show that quality-point ratio means were not affected by class size. The findings of these two relatively recent studies are not necessarily consistent with the earlier work reviewed by Hoyt (1959). Consequently, there does seem to be a need for additional research in this area.

Indirectly related is some work carried out by Harmon (1959, 1961) on the field of doctorate specialization as a function of size of high school graduating class. Harmon studied the high school backgrounds of a representative sample of science doctorates (the whole 1958 group of doctorates from American universities). When data for all scientific fields were combined, two findings were outstanding. First, the productivity of the large class-size category was three times the national norm. Second, schools with less than 100 graduates per class were all below the national norm in PhD productivity while those with more than 100 were all above the

national norm. The field of physical sciences appeared to be the most sensitive to class size with the social sciences a close second. In biology and arts and humanities, the relationship between size and production of doctorates was found, but it was not marked. The relationship was almost nonexistent for the field of education.

A possible interpretation of the above findings is that the small schools are deficient in both the laboratory equipment and the personnel necessary for the extensive pursuit of the physical and other sciences. Therefore, one pattern of thought is that if specialization is the goal, the larger school or college is probably the better one to attend (Gump & Barker, 1964). However, if versatility of experience is the objective, a smaller school or college would seem to be more effective. Baird (1969) suggests that students in small schools seem to make more efficient use of the facilities they have available. Such findings support the attempts of a number of universities to divide their environments into smaller settings. Thus, if colleges desire to increase versatility of experience and/or the rate of participation, they may divide into smaller units or possibly develop other behavioral settings (Baird, 1969).

Another implication mentioned by Baird (1969) is that talent or ability will not be developed unless it is used. It seems that students who participate in activities and have varied experiences will have more opportunities to explore their interests and abilities. Furthermore, the accumulation of experiences helps the individual develop a repertoire of coping behaviors. The individual may then draw upon these behaviors to make judgments about and engage in behaviors that lead to the completion of tasks and the pursuit of goals (Osipow & Walsh, 1970). If an individual's experiences are limited and he has not developed an adequate repertoire of coping behaviors, a potential goal of counseling might involve encouraging the student to enter certain undermanned behavior settings where the rate of participation is higher and an opportunity exists to practice certain responses. However, behavior-setting theory does not suggest any specific techniques for counselors.

In the area of community mental health, what has been viewed as internalized mental disorder might be related to coerced responses of inhabitants to a deviant environment. Thus, specialized environments seem to impose certain behaviors on their inhabitants. Raush, Dittman, and Taylor (1959) found that the aggressive behavior of boys who have been diagnosed as seriously disturbed varies a great deal across behavior settings. Willems (1964a, 1967b) studied the psychological effects of behavior-setting size on preselected marginal and nonmarginal students. He found that in small schools the marginal students reported a sense of obligation that was similar to that of their regular schoolmates. Thus, the small-school marginal students were not experientially and behaviorally marginal. However, in contrast, in the large schools the marginal students reported little sense of obligation. Here, the students were perceived as a group of outsiders. Consequently, environments in some respects select and shape the people who inhabit them. To reiterate, vironments have plans for their participants.

THE SUBCULTURAL APPROACH

The subcultural approach, as it has been used by those analyzing college environment, has been primarily concerned with identifying attitudinal or behavioral dimensions along which students tend to vary. Frequently, these dimensions are cross categorized or the variables are dichotomized and used to approximate student subgroups or subcultures.

However, in the models and typologies discussed here, the use of the term subculture is at times deceptive. A subculture implies more than a collection of people with similar attitudes or behaviors; it implies that these people interact with one another, that they are mutually attracted to one another, and that they are aware of their common orientation (Feldman & Newcomb, 1969; Newcomb et al., 1967). Thus, members of a particular subculture would tend to behave in similar ways, as part of (and consistent with) their shared understanding or perception of the environment.

Both behavior-setting theory and the subcultural approach suggest that the environment tends to shape the behavior of people who inhabit it. In this respect, subcultures may be interpreted as large behavior settings.

The Clark and Trow Subculture Model

The Model

Clark and Trow (1960; 1966) have hypothesized that there are certain broad patterns of student orientation toward college which tend to give meaning to the informed relations among students. Furthermore, they have hypothesized that these orientations may be identified as subcultures if they tend to stimulate shared perceptions and behavior among students exhibiting a common orientation. The four orientations or subcultures identified by Clark and Trow emerge from the combination of two dimensions: the degree to which students identify with ideas (much or little) and the extent to which students identify with their college (much or little). The subculture model is shown in Figure 2, which is followed by descriptions of the four subcultures (Academic, Nonconformist, Collegiate, and Vocational).

		Involved with Ideas: Much	Involved with Ideas: Little
Identify with their college: Much		Academic	Collegiate
Identify with their college: Little		Nonconformist	Vocational

Fig. 2. Types of orientations of four student subcultures.

The Academic subculture is for the most part composed of serious students who are involved with ideas and who identify with their college. These students tend to work hard, to achieve high grades, and to talk about their academic work outside of class. In general, these students pursue ideas and knowledge. Their symbols are the library, the laboratory, and the seminar. Many of the students desire to attend graduate and professional schools. They internalize scholarly and scientific behaviors anticipating future professional roles. In sum, these students are seriously involved in their coursework; and they identify themselves with their college and faculty. They perceive their school as an institution that supports intellectual values and opportunities for learning.

The students in the Nonconformist subculture are involved with ideas, but they tend not to identify with their college. Many of these students tend to be searching for a meaning in life or an identity. There is little interest in business or professional careers. Organized college activities are ignored. In general, these students tend to be characterized by a rather aggressive nonconformism, a critical detachment from the college they attend and its faculty, and a generalized hostility to the administration. In sum, this subculture seems to value and reward individualistic styles, concern for personal identity and self-awareness, and, frequently, contempt for organized society.

Clark and Trow indicated that the Nonconformist culture is for the most part a residual category. That is to say, this category includes diverse types of students such as hippies, bohemians, political activists, rebels, apathetic students, and alienated students. Some of these students are classified in this subculture simply because they do not fit in any of the other three subcultures.

Students in the Collegiate subculture tend to be loyal to their college but indifferent, if not resistant, to serious intellectual demands. Individuals in this subculture tend to value social life, extracurricular activities, athletics, living group functions, and

intimate friendships. Identification with faculty and commitment to learning is limited. Thus, this subculture tends to emphasize the social and extracurricular side of college life.

Students in the Vocational subculture tend not to be intellectually oriented. Furthermore, these students are not particularly involved with their college. To these students a college education is off-the-job training leading to a diploma and a better job than they could otherwise obtain. Ideas, scholarship, social life, and extracurricular activities are not particularly valued. In sum, the members of this subculture are primarily concerned about acquiring training for a particular career in their chosen field.

Clark and Trow (1966) cautioned that the above are four types of subcultures and not types of students, despite the fact that they often describe the subculture in terms of the students. Thus, an individual student may participate in none, one, or more than one subculture on his campus. However, in most cases one subculture will probably define a student's dominant orientation.

Validity of the CSQ Descriptions

The Clark and Trow typology of the college students has been operationalized as part of the College Student Questionnaire (CSQ)[1] (Peterson, 1965b; 1968). Students are asked to rank brief paragraph statements on each of the four orientations in order of their accuracy as self-descriptions. Responses to the four paragraph statements by entering college freshmen have been found to be related in expected ways in the Clark-Trow frame of reference to a number of variables measured by the CSQ (Peterson, 1965a).

The research using the CSQ descriptions to operationalize the Clark-Trow model has found that students describing themselves according to the four descriptions tend to report differences on attitudinal, biographical, and behavioral variables. These studies of concurrent validity indicate that a number of variables discriminate among the students associated with the different subcultures.

Evidence reported in the CSQ manual (Peterson, 1968), given here in Table 3, indicated that students who endorsed (ranked first) the Vocational self-description

[1]The College Student Questionnaires (Parts 1 and 2) were developed to facilitate gathering diverse information about groups of college students. CSQ Part 1 is designed for administration to entering students prior to the official beginning of the academic year. Part 1 contains questions about (a) educational and vocational plans; (b) activities, achievements, and perceptions during secondary school; (c) family background; and (d) personal attitudes. Part 2 is for administration to any group of undergraduates toward the close of the academic year. This part is in three sections, two of which duplicate sections (a) and (c) of Part 1. The middle section is concerned with student functioning. The purpose of the overlapping questionnaires is to permit longitudinal study of student change during the college years. The same items on the Clark-Trow typology appear in Parts 1 and 2 of the CSQ (Peterson, 1968).

TABLE 3

Correlations among the 11 Scales in the CSQ Part 2 and the Clark-Trow Orientations

Scale title	Vocational	Academic	Collegiate	Nonconformist
Satisfaction with faculty	02	18	-09	-20
Satisfaction with administration	20	03	-03	-40
Satisfaction with major	08	08	-08	-15
Satisfaction with students	08	16	-07	-30
Study habits	10	18	-09	-30
Extracurricular involvement	-30	-14	39	-24
Family independence	-01	11	-13	27
Peer independence	04	29	-33	33
Liberalism	-18	23	-13	37
Social conscience	-11	25	-07	11
Cultural sophistication	-30	32	-11	28

reported some satisfaction with the administration, a tendency to be uninvolved in extracurricular activities, and a limited concern for cultural sophistication. Students endorsing the Academic orientation reported to some extent being independent of peers, liberal, socially conscious, and culturally sophisticated. Endorsement of the Collegiate orientation was found to be most highly related to extracurricular involvement and peer dependency. Students describing themselves as Nonconformists reported a tendency to be dissatisfied with faculty, administration, and other students. Furthermore, their study habits tended to be deviant and their interest in extracurricular involvement limited. Finally, the Nonconformist displayed a degree of family and peer independence, liberalism, and cultural sophistication.

In another analysis with the same sample, analysis of variance was used to identify differences between the four Clark-Trow orientations (Peterson, 1968). Significant differences among the four orientations were obtained on 10 of the 11 scales, the exception occurring on the satisfaction with major scale. In addition, the rank order of group means on each scale was found to be predictable and interpretable. These results are shown in Table 4. The findings clearly support the notion that students describing themselves according to these four orientations tend to report differences on attitudinal and biographical variables as measured by the CSQ.

TABLE 4

Ranking of Mean Scores for the Four Clark-Trow Orientations on the 11 CSQ Scales

Scale title	Highest Mean Score			Lowest Mean Score
Satisfaction with faculty	A	V	C	N
Satisfaction with administration	V	A	C	N
Satisfaction with major	V	A	C	N
Satisfaction with students	A	V	C	N
Study habits	A	V	C	N
Extracurricular involvement	C	A	V	N
Family independence	N	A	V	C
Peer independence	N	A	V	C
Liberalism	N	A	C	V
Social conscience	A	N	C	V
Cultural sophistication	N	A	C	V

V = Vocational
A = Academic
C = Collegiate
N = Nonconformist

Apostal (1968, 1969a, 1969b) in three separate studies has explored the relationships between the four CSQ descriptions and personal values, peer independence, and personality type. In an investigation (Apostal, 1968) of the relationships between the CSQ descriptions and personal values (as operationalized by the Allport-Vernon-Lindzey Study of Values), only a small number of significant relationships were found. Students in subcultures based on ideas (Academic and Nonconformist) typically scored low on the Economic scale; students in the subcultures based on nonideas (Vocational and Collegiate) typically scored average and high. Students in college subcultures (Academic and Collegiate) scored average on the Religious values scale while students in the noncollege subcultures (Vocational and Nonconformist) on the average scored high.

In a study focusing on peer independence (Apostal, 1969a) the CSQ was administered to 1,500 entering freshmen at the University of Maine. The students were divided into three groups of peer independence (low, average, and high) based

on the CSQ Peer Independence Scale scores. In general, relationships did seem to exist between the subcultures and peer independence. High peer independence was found to be positively associated with the Academic and Nonconformist subcultures and negatively related to the Collegiate subculture. These relationships existed for men and women.

In the third study (Apostal, 1969b), personality type and preferred subculture were analyzed. Choice of major field was used to assign students to one of Holland's (1966a) six personality types (Realistic, Investigative, Social, Conventional, Enterprising, and Artistic). Men assigned to the Realistic type disproportionately selected the Vocational description. Intellectuals disproportionately chose the Collegiate or Academic description. The Enterprising type selected mainly the Collegiate description. For women the Social type was found to be associated with choosing the Collegiate description; the Artistic type, the Nonconformist description; and the Investigative type, the Academic description. From these results, relationships do seem to exist between student characteristics (personality type) and types of college environments.

McDowell (1967) explored the relationships between the Clark-Trow descriptions and the College and University Environmental Scales. The results indicated that students with a Vocational orientation tend to perceive a practical (Practicality) college environment. Students reporting an Academic or Nonconformist orientation tend to perceive an environment emphasizing self-understanding and personal identity (Awareness). Students with a Collegiate orientation tend to perceive a friendly, group-oriented environment (Community).

A second part of the study by McDowell was concerned with the relationships between the Clark-Trow orientations and the scales on the Omnibus Personality Inventory (Heist & Yonge, 1968). Nonconformists tended to be highest on the self-expression (Impulse Expression) and the intellectual scales (Thinking Introversion, Theoretical Orientation, Estheticism, and Complexity), followed by the Academics and the Collegiates. Nonconformists were low on social outreach (Altruism) and personal adjustment (Personal Integration). Students reporting a Vocational orientation were high on the Practical Outlook scale.

Kees and McDougall (1971) also used the same Omnibus Personality Inventory to explore personality differences among subcultural groups. Similar to the findings of the McDowell (1967) study, Nonconformists tended to score significantly higher on Theoretical Orientation, Estheticism, and Complexity than did the Vocational and Collegiate groups. In addition, the Nonconformist group was found to score significantly higher than the other three groups on Thinking Introversion, Autonomy, and Religious Orientation (thus reflecting a more liberal view), and Impulse Control. However, on the Personal Integration scale, the Nonconformist group scored significantly lower than the other three groups. Also, on the Practical Outlook scale, the Academic and Nonconformist groups scored significantly lower than the other two groups. On the Social Extroversion scale, the Collegiate group

scored significantly higher than the other three groups. The remaining four scales (Anxiety Level, Altruism, Masculinity-Femininity, and Response Bias) did not discriminate among the groups.

Maw (1971) explored Clark-Trow descriptions and activity involvement. The findings showed that students endorsing the Collegiate descriptions ranked first in activity participation, followed by the Nonconformist, Academic, and Vocational subcultures in that order. Significant ($p<.05$) differences in the mean number of activities were found when the Academic subculture was compared with the Vocational and Collegiate subcultures and when the Vocational subculture was compared with the Collegiate and Nonconformist subcultures.

Finally, Brainard and Dollar (1971) studied the personality characteristics of leaders endorsing the different Clark-Trow descriptions. Their sample consisted of student leaders (presidents) of recognized student organizations at the University of Missouri. Five of the 12 personality factors tended to discriminate among the three subcultures. On the Motivation factor the Academic leaders scored significantly ($p < .01$) higher than the Collegiate leaders. On the Applied Interests factor the Vocational leaders scored higher ($p < .06$) than the Academic leaders. The Collegiate leaders scored significantly higher than the other two groups on both the Closeness factor and the Friendliness factor. Also, on the Expressiveness-Constraint factor the Collegiate leaders scored higher than the Vocational leaders. In general, the results indicated that apparently student leaders differ according to the Clark-Trow description endorsed.

Some research has used descriptive paragraphs corresponding to each of the Clark-Trow subcultures that are somewhat different from the Peterson (1965b, 1968) descriptions. Gottlieb and Hodgkins—using their own descriptions of the subcultures—explored the social composition, academic performance, attitude change, and postcollege expectations of students in the different subcultures (Gottlieb, 1965; Gottlieb & Hodgkins, 1963; Hodgkins, 1964). In their results, vocational students came primarily from lower class rural areas, ranked third in grade point average compared with students in the other subcultures, reported relatively little change in attitudes (religion and rules and regulations), and reported plans to enter career or military positions after college. Students identifying with the Collegiate subculture came about equally from lower, middle, and upper class homes (primarily urban areas), ranked lowest in grade point average, reported little attitude change in college, showed minimal interest in attending graduate school, and had the most interest in making money. Academic students reported coming mainly from the middle and upper class in metropolitan areas ranked second in grade point average, evidenced more attitude change (ranked second), and showed a greater interest in attending graduate school than the Vocational and Collegiate students. Nonconformist students reported coming from the lower and middle class in rural areas ranked highest in grade point average and amount of attitude change, and reported the strongest interest in attending graduate school.

VanAdams (1965), using the Gottlieb and Hodgkins (1963) descriptions, investigated the characteristics of 260 undergraduate students at Michigan State University. The students (primarily seniors) were living in a coeducational residence hall. A number of variables (place of residence at the beginning of the third year of college, college major, academic ability, marital status, and attitude change) were found to discriminate among the students endorsing the different descriptions.

Lewis (1969), in exploring the aspirations and values of students associated with the different subcultures, did not use self-endorsed descriptions to classify students. Rather, he divided students into four subcultures according to their answers to two questions (importance of new ideas and the closeness to their college). According to his findings, about one-half of the Vocational subculture and one-third of the Collegiate group were in college primarily to obtain a degree. More than half of the students in the Academic subculture reported primary interest in knowledge and understanding. During their leisure time all of the Nonconformist students and three-fourths of the Academic students pursued intellectual and musical interests. The students associated with the Collegiate subculture reported involvement in the greatest number of extracurricular activities while the Vocational students reported the fewest. About half of the students in the Academic subculture found a professor stimulating. In general, the Nonconformist and Academic students were more interested in autonomy than were students in the other subcultures. Finally, students in the Academic subculture were highest in humanitarian values, followed by students in the Nonconformist subculture.

The findings, then, generally indicate that students endorsing the various CSQ descriptions do tend to report differences in values, interests, attitudes, and behaviors. Furthermore, the CSQ descriptions seem to be related in predictable and meaningful ways to scales measuring similar constructs.

Reliability of the CSQ Descriptions

The work in this area is very limited. McDowell (1967) studied the consistency in the reported CSQ descriptions over a 6-month period. The sample consisted of 2,000 students in 13 small colleges. The students responded to the Clark-Trow descriptions (Peterson, 1965b) in their first week in college and a random 25% of the sample responded in the spring. The findings showed that in the spring over half of the students reported their original orientation. A shift toward the Collegiate orientation occurred at the expense of the Academic orientation. This finding does not mean that the descriptions are unreliable since it makes sense that the orientations probably change as a function of environmental impact over some period of time.

Summary

In their model, Clark and Trow identified four student subcultures (Academic, Nonconformist, Collegiate, and Vocational) based on the combinations of two

dimensions: students' identification with ideas and students' identification with their college. The thought was that although students might participate in none or one or more subcultures on a campus, only one subculture would probably identify a student's major orientation. The Clark and Trow subcultures have been operationalized by four descriptions in the College Student Questionnaire as well as by other means. Research using these instruments indicate that students describing themselves according to the four orientations tend to report interpretable differences on attitudinal and biographical variables. Other research suggests that the four orientations tend to be related in predictable ways to scales measuring similar constructs. However, no research on the Clark-Trow model has attempted to test theoretical predictions. No research, in short, shows that students endorsing a common orientation actually interact with one another. In essence, there is no evidence indicating that students indeed enter and participate in interactional environments that are congruent with their major subcultural orientation.

The Newcomb Subculture Model

The Model

Newcomb and his associates (1967) have explored student types and subcultures at Bennington College as part of a 25-year follow-up study. The initial study (Newcomb, 1943) published 30 years ago reported the effects of shared social norms of the members of the college community. The follow-up study suggests that, for many students, the effects of the college experience were lasting. The discussion here will focus on the follow-up research.

In the follow-up research more than 90% of the graduates of three consecutive Bennington classes in the 1930s were located and reinterviewed. In 1959 through 1962, data about the Bennington College norms were collected from the current college student sample. One finding of interest was the fact that many of the current students described at least two of the student houses in ways that did not seem to be consistent with the student culture norms that had existed at Bennington. These students in atypical houses were described by the current student sample as being interested in social activities and possessing conventional social attitudes.

In order to develop a typology of students, the 28 adjectives which had been most frequently used by students in describing the various houses were grouped by 150 students according to similarity of meaning. A given adjective was included in a cluster if at least 50 students grouped it with at least two other adjectives in the cluster. As shown in Table 5, two clusters were derived by this technique: Cluster I refers to students who are socially oriented and conventional in a Collegiate way; Cluster II identifies students who are individualistic and intellectual. At the time of the study the student norms at Bennington were consistent with Cluster II.

TABLE 5

Clusters Derived from Students' Sorting of Stereotypes

Cluster I	Cluster II
Collegiate	Arty
Preppy	Free-thinking
Smithy	Boho
Social	Eccentric
Socialites	Benningtonian
Debs	Beat
Tweedy	Wild
Ann Carter	Intellectual
American girl-type	
All-around	
Gung-ho	

Students were also asked to describe campus subgroups which could be differentiated by their interests, attitudes, or values. It was hoped by this procedure to accumulate a list of types of students perceived to exist on campus. No attempt was made to order the subgroups listed by the students along a single dimension; rather it was assumed that there existed two dimensions (Individualism and Intellectuality) independent of each other and forming a model of the social structure of the student body (see Figure 3). The description of the subgroups reported by the students were next used to develop descriptions of the four ideal types—Creative Individualists, The Wild Ones, The Scholars, and The Social Group. These four types seemed to be the most frequently mentioned by students. It was hypothesized that the types were derived from differences in orientation to the dominant norms of the student culture. Two other types (Leaders and Political Activists) were added probably because of the relevance of politics to Bennington in the 1930s. However, these two types were not frequently mentioned by the students. The following are descriptions (operational definitions) of the six types developed using the language of students:

1. High Individualism—High Intellectuality

These girls (Creative Individualists) perceive themselves to be superior intellectually and more sophisticated than other people. In general, they tend to believe in certain principles even though they are usually opposed by society. They seem to be imaginative, free-thinking, and very dedicated to creative pursuits. These students frequently major in drama, art, or literature.

2. High Individualism Low Intellectuality

The Wild Ones tend to be free bizarre girls who care little about work and a lot about excitement. In general, these girls tend to be unkempt and uninhibited. They enjoy wild parties and like to be different, but they frequently feel misunderstood.

3. Low Individualism—High Intellectuality

The Scholars are primarily interested in learning and furthering their education. These students concentrate mainly on their work and spend most of their time in the library. In general, these girls tend to be rational and critical. Their social interests are limited and they tend to have few friends.

4. Low Individualism—Low Intellectuality

Girls in The Social Group are very interested in their social life. These students do enough work to pass their courses, but their main interest is in having fun. They concentrate on dating and meeting boys. Their extreme interest in social life and being popular may tend to mask their intelligence.

5. The Leaders are friendly students who are particularly interested in student government. They are frequently involved in organizing committees or groups.

6. The Political Activists are civic-minded reformists either of campus politics or of social conditions in the country in general. These people are interested in public affairs, civil rights, and sane nuclear policy. This interest is frequently expressed through the circulation of petitions.

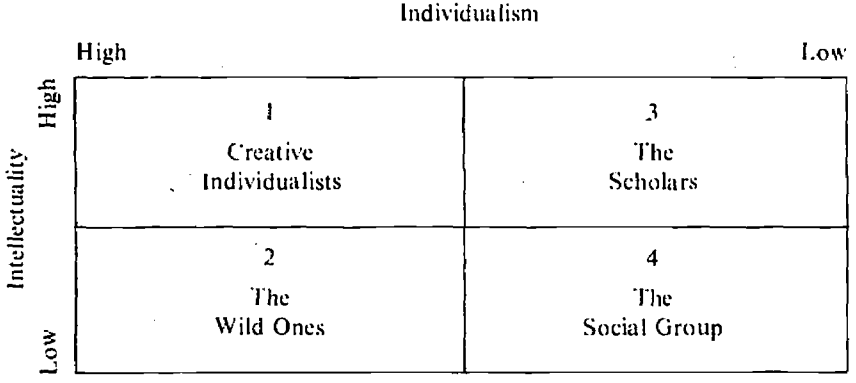

Fig. 3. Hypothetical student subcultures.

Validity of the Type Descriptions

The six descriptions were used to operationalize the appropriate elements of Newcomb's model. Newcomb et al. (1967) had 40 student judges identify girls who seemed to fit each of these types. The students assigned to the various types were then compared on a number of variables. The most striking group differences were found between the Creative Individualists and The Social Group. On the Omnibus Personality Inventory (OPI) (Heist & Yonge, 1962) the Creative Individualists were found to be significantly ($p < .01$) higher than The Social Group on all scales (Atheism-Agnosticism, Developmental Status, Estheticism, Theoretical Orientation, Originality, and Liberalism) except Nonauthoritarianism. These findings support the hypothesis that the Creative Individualists are highest in norm acceptance (Individualism and Intellectuality). Furthermore, the results indicate that The Social Group is lowest on individualism and intellectualism and thus lowest in norm acceptance. Three of the other groups (The Wild Ones, The Political Activists, and The Scholars) tended to be closer to the Creative Individualists than to the total college means on all scales.

To explore further differences in student types, 12 7-point rating scales were administered to the entire college sample and the scale scores were then factor analyzed. Three factors emerged: traits related to individualism, traits related to intellectuality, and traits unrelated to norms. The Social Group was determined to be significantly ($p < .05$) different from the Creative Individualists on four of the five scales included on the individualism factor. Members of The Social Group reported being more conservative, conventional (in dress and opinion), and date conscious than did the Creative Individuals. However, on the intellectual factor, the two groups did not differ on the three scales (intellectual, absorbed in academic work, and interest in national and international affairs). On the factor interpreted as traits unrelated to norms, The Social Group reported being more interested in religion than did the Creative Individualists. No differences were found on the other three scales associated with this factor (tenseness, impulsiveness, and dedicated to a special field).

In regard to the other groups, The Wild Ones scored high on unconventionality (in dress and opinion), intellectualism, tenseness, impulsiveness, and interest in social life. However, they rated themselves low on absorption in academic work. The Scholars scored low on absorption in social life and in being critical of rules. The Leaders' self-reports were similar to those of The Social Group, except they perceived themselves as highly critical of rules. The Political Activists scored high in interest in national and international affairs, and low in compliance.

Other comparisons showed differences between the Creative Individualists and The Social Group. An index of conventionality—the average number of adjectives from Cluster I which the student checked as favorable—was found to discriminate between the two groups. The Social Group selected many adjectives as favorable, as shown by a mean of 4.2; the mean for Creative Individualists was only 0.2.

Three other indices (small talk, serious conversation, presence on campus during weekends) were used in another measurement of intellectuality. The small talk index represents the amount of time devoted by the student to conversation about social life, personal problems, etc. The serious conversation index is concerned with the amount of time reported in talking about the arts, public affairs, etc. The number of weekends on campus was an attempt to assess student dating and off-campus interests. The Creative Individualists were found be be significantly ($p < .05$) more intellectual than The Social Group on all of the variables except the serious conversation index. However, of the three variables the serious conversation index would seem to be the most relevant measure of intellectualism.

The different student types were also compared on political attitudes, community participation, and personal background and interests. On measures of political attitude (radicalism and welfare-civil-liberties index), the Political Activists scored significantly higher than the other types. There was a tendency for the members of The Social Group to score lowest on these scales. On the community participation variable (student government) participators were most frequently drawn from the Leader Group. Members from other groups (Creative Individualists, Political Activists, and Scholars) participated in that order. The Wild Ones were the lowest participators in student government. On background and interest variables The Social Group was found to be significantly ($p < .05$) different from the Creative Individualists on the private versus public school attendance variable. Sixty-two percent of The Social Group attended private school at some time during their secondary school career. Of the Creative Individualists, 63% had attended only public high school. In addition, The Social Group had the highest percentage (57%) of fathers with business occupations. (The average for the college in general was 45%.) Data on career interests showed that The Social Group members were mainly social science majors. More than 50% of The Social Group members reported an interest in occupations classified as service, general cultural, and business. Many of the Creative Individualists expressed career interest in the arts. Finally, the Creative Individualists and the Leaders tended to be primarily juniors and seniors. The members of The Wild Ones and The Social Group were mainly freshmen and sophomores. Thus, in general, students tended to perceive seniors as being similar to the Creative Individualists and freshmen as being similar to the Social type.

On the variable of within-college status, as assessed by the students in the college, the Creative Individuals and The Social Group were ranked first and last, respectively. The Scholars, Leaders, Political Activists, and The Wild Ones (in that order) were in between these extremes. In general, students who were nominated by others as belonging to a given type tended to rank that type higher than it was ranked by students in the other types or by the total college. These findings suggested that students nominated for a particular type tend to identify themselves with that group.

Three individual measures of within-college status (community representativeness, degree of admiration, and degree of creativity) supported the status order found

above. College students were asked to nominate classmates in these three areas. The Creative Individualists received the highest mean score on each measure, while The Social Group and The Wild Ones scored the lowest.

To summarize, the findings indicated that students were able to identify girls who fit each of the types. Attempts were made to discriminate between the types on a number of variables such as personality, self-ratings, conventionality, small talk, serious conversation, political attitudes, community participation, personal background and interests, and status. These variables to some extent differentiated among the types. The Creative Individualists and The Social Group seemed to be the most clearly defined.

Research

Research Testing Theoretical Predictions

Research findings (Newcomb et al., 1967) showed that in particular the Creative Individualists and the members of The Social Group tended to evidence a substantial degree of intragroup attraction to interact with one another, and to choose each other as friends. The Scholars, Leaders, and Political Activists exhibited some degree of intragroup attraction. For The Wild Ones, intragroup attraction was low; members of this group did not seem to be mutually attracted to one another. Therefore, The Wild Ones did not seem to be a subcultural group.

The results implied that The Social Group may have served to maintain the attitudes and values of participants. From this implication, it was hypothesized that The Social Group may have functioned to insulate students from pressures to change toward the dominant norms in the environment (Individualism and Intellectuality). Furthermore, it seemed that The Social Group may have provided for its members opportunities for friendship and prestige which otherwise would not exist. Thus, for Bennington at the time of the study, The Social Group appeared to be a deviant subculture (one with members whose attitudes and values were discrepant from the attitudes of the majority of students).

In order to explore the plausibility of this interpretation, the influence of the deviant Social Group subculture upon its members was studied. Deviance was defined by using scores on five of the scales of the OPI (Developmental Status, Estheticism, Liberalism, Originality, and Theoretical Orientation). Freshman students whose scores fell below the median (for all students who completed the OPI at least once) on all five scales were defined as deviant. Thirty-seven students met this criterion and were thus included in the sample. Of this sample, 16 students were judged to be participants in the Social Group subculture. The remaining 21 students were identified as Nonsocial Group deviants or the control group. The two

groups of deviants were compared on the five scales of the OPI used to define deviants. No statistically significant differences between the two groups were found.

The findings concerning patterns of interpersonal association suggested that Social Group members did tend to choose Social Group friends and that Nonsocial Group deviants tended to choose nondeviants as friends. Other results showed that the Social Group members tended to concentrate in particular houses; they chose to live together or at least in close proximity. The Nonsocial Group deviants were dispersed throughout the 12 on-campus houses.

Other findings showed that the Social Group members tended to be defined by their fellow students as deviant. Students were asked to identify three others who would be most similar and three who would be least similar to them in their self-ratings. The number of times a student was listed as least similar was used as an index of her visibility as a deviant. The results showed that 75% of the Social Group deviants were mentioned two or more times. However, only 40% of the Nonsocial Group deviants were mentioned at least twice. Furthermore, the Social Group members themselves tended to perceive themselves as more deviant than the Nonsocial Group deviants.

The OPI was administered twice in order to gather information about attitude change and stability. Change scores were computed on the five scales used to define deviance. The findings indicated that Nonsocial Group deviants tended to change their attitudes in the direction of the existing campus norms of individualism and intellectuality. The Social Group members did not evidence such change. These results certainly suggest that a subculture tends to serve a maintenance function by facilitating resistance to the normative influence of the larger, more dominant group.

On the variable of college status, students (nondeviants) were asked to name at least two but not more than five students who would be worthy representatives of the college at a gathering of students from many colleges. It was predicted that the Social Group members would have lower status (fewer nominations for community representatives) than would Nonsocial Group deviants. In this case, the data did not support the prediction. However, the data did show that Social Group members tended to gain in status because of the prestige received from other members of their subculture. In an examination of the nominations for community representatives made by just the two deviant groups, the results showed that Social Group deviants seemed to vote for other Social Group members. The Nonsocial Group deviants made responses similar to the student body in general and voted high status to students identified as Creative Individualists.

Other findings indicated that significantly more of the deviants dropped out of college than did the nondeviants. Of the 109 deviant students, 44 (40%) dropped out of college; of the 276 nondeviants, only 81 (29%) dropped out. The data did not

reveal a significant difference, however, in dropout rates between the Social and Nonsocial group deviants. (Actually there were not enough dropouts from the two groups of deviants to permit direct comparison.)

In summary, the findings indicated that the Social Group members constituted a deviant subculture. The members evidenced similar attitudes, they were mutually attracted to each other, and they were aware of their common orientation. In general, the Social Group members tended to share norms which diverged from the dominant student culture; as such, the subculture served to insulate its members from the influence of the dominant culture.

Summary

Newcomb and his associates have developed a hypothetical typology based on the two dimensions of individualism and intellectuality. These two dimensions were assumed to represent the basic normative social structure of the student body. Four types were included in this typology: Creative Individualist, The Wild Ones, The Scholars, and The Social Group. Two other types thought to be of significance (Leaders and Political Activists) were also explored. In studying the utility of the typology it was determined that students could indeed identify girls who fit each of these types. To some extent, moreover, the types could be distinguished from each other on a number of variables. The data further suggested that The Social Group was a deviant subculture serving to maintain or even facilitate resistance to change on the part of its members.

Evaluation

There seems to be one requirement in the definition of subculture which is only partially met by most models using the subculture concept. This requirement is that individuals or students in a subculture interact with one another and that they be aware of their common orientation. With one exception there does not exist data showing whether students classified as being similar in attitude interact to form a subculture. Only Newcomb et al. (1967) presented the necessary evidence—finding that the members of a deviant group did evidence mutual attraction and awareness of common orientation along with similar attitudes.

One implication of the subculture concept is that the attitudes and values held by members are learned in the environment: the subculture has had an impact upon its members. Attitudes and values have been taught and maintained by the members of the subculture. However, research shows that entering freshmen in a number of colleges and universities were able to classify themselves into one of the Clark-Trow subcultures at the beginning of the freshman year. Thus, it would seem that their

orientations predated their college experience. It is possible, of course, that their orientations derived from subcultures in their high schools.

Another weakness of the subculture models, at least in common practice, is that they fail to differentiate between a type and a subculture. Students may be classified as a type if they share common charcteristics. If the subculture concept is to be a distinct and meaningful concept, it must be differentiated in theory and practice from the concept of type. The nature of the existing research contributes to this ambiguity. In general, research data tend to be descriptive of student types rather than of subcultures. Only one study (Newcomb et al., 1967) has explored the validity of the concept of an *interactional* student subculture.

Also of interest is the fact that subculture models tend to describe students who have some dominant traits or characteristics (Bolton & Kammeyer, 1967). The students tend to be somewhat exceptional or at least not average. There seems to be little place for many students who are unexceptional in any way. One way of thinking about this is that there may be more (or less) than 4, 5, or 6 or any other number of subcultures, depending upon the environment in which an individual is interacting.

Another aspect which needs to be considered is that of the importance of gender in the study of subculture. Clark and Trow in effect have based their model on college males. Newcomb has based his model on college females. The assumption that one can generalize from one sex to another is somewhat tenuous. Sex differences for a given subculture model need to be explored.

An additional limitation involves the nature of the research on the subculture models. Extant research on the Clark-Trow model in particular assumes that the four subcultures exist. Thus, the main purpose of the research has been to describe the presumed subcultures in terms of the student attitudes, interests, and behaviors that might differentiate among them. None of the studies has clearly indicated that the Clark-Trow subcultures actually exist in the first place. The existing research does not really test the model. It is almost entirely descriptive (Frantz, 1969). Research problems are further complicated by the Clark-Trow definition of subculture. Clark-Trow seem to define their subcultures independent of the actual behaviors of the individuals making up the subcultures. Frantz (1969) suggests that, because of this partially nonempirical posture, measurement is complicated.

As has been noted, no research using the Clark-Trow model presents data that students exhibiting a common orientation actually interact with one another. As part of this limitation, there is no evidence indicating exactly which types of individuals enter a subculture and participate in environments congruent with their major orientation. Hence, the relationships between the degree of individual environment congruency and other variables (such as achievement, satisfaction, and personal stability) have yet to be explored.

In the Newcomb frame of reference, one study did show that members of the so-called Social Group seemed to enter environments consistent with their orientations. The members of this group tended to live together and to interact with one another. The members were mutually attracted to one another, and they were aware of their common orientation. However, once again no studies in this framework have investigated the relationships between degree of individual-environment congruency on the one hand and amount of achievement, satisfaction, and personal stability, on the other.

The subcultural approaches have been operationalized by means of brief paragraph statements of various orientations. The Clark-Trow model asked students to endorse an orientation as appropriately self-descriptive. The Newcomb model had student observers assign other students to various orientations. The research stimulated has attempted to describe and to distinguish among the various endorsed orientations. Thus, the environment is defined and described by taking a census of the self-reported and/or observer-imputed attitudes, values, behaviors, and roles of people not necessarily known to be interacting. Although some research (McDowell, 1967) has shown that students endorsing a given orientation tend to vary in their self-reported perceptions of the environment, there generally is little direct measurement of the perceived environment or of the physical environment as part of the subcultural approach.

Another interesting feature of the subculture model is that the individual as well as the environment seems to be defined in terms of group characteristics. There is no conceptually distinct orientation to the individual and to the environment. The major focus of the approach is on the environment which, in turn, is defined in terms of the characteristcs of its members. But, at least implicitly, the individual is described in terms of the group characteristics. Thus, an independent conception of the individual does not seem to exist.

A few other limitations of the subculture approach may be mentioned. The models discussed here seem to be restrictive in nature. Without adjustment in content, it would be difficult to generalize the models to a noncollege population. Furthermore, each model is based on only two dimensions which are dichotomized and used to approximate student subgroups or subcultures. The dimensions are clearly and explicitly stated, but other variables may be just as relevant. Or, it is possible that more than four subgroups or subcultures may be prevalent in a given environment. In addition, the models tend to say little about the developmental process of group or subculture orientations. Nor do the models discuss the process of learning or individual change. In regard to known empirical findings, the models are not that inclusive. Many investigators have developed models derived from the Clark-Trow classification, but for the most part they are not empirically based. Last, the models (particularly that of Clark-Trow) have stimulated some research, but very few of the studies have in any direct way attempted to test or to evaluate the existing models. The research has been primarily descriptive.

Implications for Theory, Research, and Application

Theoretical Implications

A number of student typologies or subculture models have been developed based on different dimensions from those used by Clark and Trow (see Bolton & Kammeyer, 1967; Coleman, 1966; Keniston, 1966; Mauss, 1967; Pemberton, 1963; Schumer & Stanfield, 1966; Stanfield, 1965,1966; Warren, 1967, 1968). However, these typologies or models seem to have some categories that parallel the Academic, Nonconformist, Collegiate, and Vocational (Feldman & Newcomb, 1969). Furthermore, with the exception of the Newcomb et al. (1967) study, these investigators do not present evidence that students classified as being similar in attitude interact to form a subculture.

The subcultural approach is theoretically similar to behavior-setting theory but operationally different. Both approaches suggest that environments select and shape the behavior of people who inhabit them. From one point of view the various subcultures seem to be large behavior settings. The underlying theoretical assumption is that subcultures and behavior settings both have a coercive influence upon the behavior of their members. The operational difference is that behavior-setting theory is primarily concerned with behavioral units. Operationally, behavior-setting theory takes a census of the frequency and the intensity of behavior of people known to be interacting in a setting. The subcultural approaches are primarily concerned with self-reported attitudes, values, and roles. Operationally, the subculture models take a census of the self-reported attitudes, values, and roles of people not necessarily known to be interacting.

Implications for Research

Future research might beneficially focus on what determines the decisions of students to enter and to participate in certain subcultures rather than others. Additional research might attempt to trace the developmental process of various subculture orientations and their impact on members' attitudes and behaviors. Most likely it would be of value for future work to consider possible sex differences in the conceptual development of subculture models or typologies as well as the empirical social processes involved.

Bolton and Kammeyer (1967), in their model, have included sex as a variable. These authors hypothesized that males and females would differ in attitudes and behaviors related to different role orientations. They prefer to use the concept of role orientation mainly because they argue that the subculture concept is without empirical foundation. These investigators define role orientations as perspectives available in a social system. A role orientation defines the goals to be pursued in performing the role, the value of the role, and the alternative behaviors available in playing the role. In exploring sex differences, this finding showed that a number of

behavior and attitude differences were greater within some role orientations than between orientations.

The concept of "interpersonal environment"—introduced by Rossi (1966) and operationalized by Wallace (1966)—may be of value in subculture research. Briefly, an individual's interpersonal environment consists of all people with whom the individual in question is in some sort of enduring contact. In assessing an individual's interpersonal environment, an attempt is made to identify with whom, how frequently, and with what attraction a person interacts with other people in a given population. Actual data collection centers around three main variables: interaction, attraction, and content. Frequency of interaction is assumed to indicate the opportunity for influence: the more frequent the interaction between individuals, supposedly the more likely are the opportunities for them to influence one another. Regarding the variable of attraction, the more an individual values (positively or negatively) the other person involved in interaction, the more likely he is to be influenced by that person. Finally, the content variable is defined by the stimuli (attitudes, values, and behaviors) which are communicated in interaction. These stimuli indicate the possible direction in which the influence will probably be exerted.

In general, the validity of the subculture position would certainly be aided if it could be shown that people classified as being similar in attitudes tended to have some sort of enduring contact. The interpersonal environment concept may be of measurement value in producing evidence

Applied Implications

An applied implication of the subcultural approach is that a subculture can provide support for individual stability by means of value reinforcement. On the contrary, however, subcultural value reinforcement may also provide support for directional movement. Some research suggests that experiences associated with different subcultures or environments may tend to have an accentuation effect on members (Feldman & Newcomb, 1969). This effect refers to the increase of the initial differences among students entering different subcultures. It seems that environments tend to extend certain characteristics over time. Furthermore, this extension or accentuation effect may be associated with the amount of time spent in an environment. Therefore, the attitudes, values, and behaviors which motivate an individual to enter and interact in an environment may tend to be reinforced and accentuated by the experiences in the environment.

Whether or not subcultures challenge values and promote value change is an empirical question. It does make sense, however, that a basic purpose of certain subcultures is to challenge old values and stimulate change. Feldman and Newcomb (1969) reported evidence indicating that peer groups are able to challenge old values, provide intellectual stimulation, present new experiences, help clarify self-identity, and provide support for members who are changing. It is

also possible that in the process of changing certain values and attitudes, a person may change subculture associations, e.g., a person may move away from old friends and make new friends.

In summary, the approach proposes that the subcultures seem to have a coercive influence upon the behavior of their members. This viewpoint emphasizes the effect of group attitudes (the environment) upon behavior. Thus, the members of a particular subculture would tend to behave in ways consistent with their shared understanding and perception of the environment. Similar to behavior-setting theory, the subcultural approach attempts to define the environment more objectively. The next theory on the continuum from least phenomenologically oriented to most phenomenologically oriented is Holland's theory of personality types and model environments. Holland's theory suggests that the dominant features of an environment are dependent on the typical characteristics of its members. The measurement technique involves a census of the self-reported preferences and behavior of the members of a population. This operational definition to some extent suggests how individuals behave in different environments.

HOLLAND'S THEORY OF PERSONALITY TYPES AND MODEL ENVIRONMENTS

Introduction

To John Lewis Holland (1966b) human behavior is a function of both the individual's personality and the environment in which he lives. Thus, as part of his theory of personality types and model environments he is concerned with assessing the individual and the environment.

Holland, born in 1919, completed his undergraduate degree at the University of Omaha in 1942 and his PhD in psychology at the University of Minnesota in 1952. He taught and was active in counseling and clinical activities at Western Reserve University and at the Perry Point Veterans Administration Hospital in Maryland from 1952 to 1956. In 1956 he became the Director of Research of the National Merit Scholarship Corporation. There he developed a stimulating research division, composed of men such as Alexander Astin, Donald L. Thistlethwaite, Robert C. Nichols, and Donivan J. Watley.

In 1964, Holland assumed the positions of Vice President for Research and Development of The American College Testing Program and Professor of Education and Psychology at The University of Iowa. He spent the year of 1965-66 in California as a fellow in the Center for the Advanced Study of Behavioral Sciences. Since 1969 he has been a Professor of Education and Social Relations and the Director of the Center for Study of the Social Organization of Schools at Johns Hopkins University. He was elected President of Division 17 (Counseling Psychology) of the American Psychological Association in 1969. Currently he is a consulting editor for the *Journal of Vocational Behavior* and previously served in the same capacity for the *Journal of Applied Psychology*.

Background and Development

Holland's theory was initially presented in a series of articles and has been summarized in a recent book (1966). A revised edition of this book will probably be available in 1973. The underlying rationale of Holland's theory is that human

behavior is a function of personality and environment. To elaborate and support this basic rationale, Holland (1966) has developed certain significant background concepts.

To Holland (1966), the choice of a vocation is, in part, an expression of personality. Empirically, it appears that vocational preferences are moderately related to personality. Because vocational preferences are thus correlated with vocational interests, it is a plausible supposition that vocational interests are in part an expression of personality. In Holland's schema, vocational interests are not an isolated entity, but a product of an individual's life history (heredity, cultural and personal forces, and the physical environment). Thus, Holland developed an instrument—called the Vocational Preference Inventory—based directly on the idea that preferences for occupations indeed are expressions of personality. The argument is that occupations represent a way of life. The way people think about occupations (even vocational stereotypes) not only stimulates individual vocational preferences to some extent but also appears to have reliable and significant meanings. We tend to judge people by their vocations as well as by their friends and behavior. This being the case, it follows that the members of a vocation would tend to have somewhat similar personalities and histories of personal development. Holland suggests that a person enters a specific vocation because of his or her personality and history. Because the members of a vocation tend to have similar personalities, they probably tend also to respond in similar ways in many situations. Given the validity of these suggestions it may further be agreed that a fit or congruence between the individual's personality and environment contributes to vocational satisfaction, stability, and achievement.

Theory

Assumptions

Holland (1966), in developing his theory of personality types and model environments, has made the following assumptions. First, that people may be characterized by their resemblance to one or more personality types. A type is defined as a cluster of personal attributes which may be used to measure the person. Six basic personality types are described: Realistic, Investigative, Social, Conventional, Enterprising, and Artistic. The argument is that an individual's dominant type or orientation essentially is the product of his or her life history. People generally possess characteristics of all six types, but Holland's suggestion is that each individual behaves in a manner reflecting one or two of these orientations more strongly than the others. Therefore, the closer an individual resembles a particular type, the more likely it is he or she will exhibit personal characteristics

and behaviors consistent with that type. A second assumption is that the environments in which people live may be characterized by their resemblance to one or more model environments. Six model environments are suggested, corresponding to the analogous personality types. In short, for each personality type there is a related environment. The theory hypothesizes that Investigative types search for Investigative environments and that Artistic types search for Artistic environments, and so forth. The final assumption is that congruent person-environment relationships (a Realistic type in a Realistic environment) lead to outcomes that are predictable and understandable from the knowledge of the personality types and the environmental models. These outcomes include vocational choice, vocational stability and achievement, personal stability, creative performance, and personal development.

Other relevant concepts used to describe person-environment interactions are consistency and inconsistency. These concepts are defined in terms of the similarity of the primary (dominant) and secondary personality types or environmental models[1] as identified by the Vocational Preference Inventory (which assesses the personality type) or the Environmental Assessment Technique (which assesses the environment). For example, the Realistic (primary) and Investigative (secondary) types for men are correlated .49 and hence are relatively consistent with one another. However, the Conventional and Artistic types are inconsistent ($r = -.09$). Holland further assumes that when a person with a consistent personality type (Realistic-Investigative) enters an environment which is consistent and congruent (Realistic-Investigative environment), he or she will tend to be more productive. On the other hand, inconsistency between type and environment produces dissatisfaction, changes in vocational choice, lack of achievement, and personal instability.

The concepts of homogeneity and heterogeneity are also used to describe person-environment relationships. Homogeneity is defined in terms of the extent of the difference between the highest and lowest scores for a type or environment. (A small difference indicates heterogeneity). According to Holland, the pairing of a homogeneous (dominant) type and a homogeneous (dominant) environment will contribute in some way to certain individual outcomes (satisfaction and achievement).

At present, the exact impact on individuals of congruency, consistency, and homogeneity is an empirical question. However, it is assumed that congruent, consistent, and homogeneous pairings of the individual and his or her environment will contribute in some way to such individual outcomes as his or her personal stability, achievement, and satisfaction.

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[1]The secondary type or environment for an individual is that type or environment that the son resembles secondarily.

Personality Types and the Vocational Preference Inventory (VPI)

The formulation of the personality types developed out of Holland's clinical experiences and has been concretized as part of a personality inventory called the Vocational Preference Inventory. As noted, Holland assumes it possible to characterize people by the degree of their resemblance to one or more personality types (the individual's dominant orientation being the product of his or her life history). He has described each type in terms of a theoretical model orientation. A given model orientation is presented in terms of individuals' adaptive behaviors, needs, motives, self-concepts, life histories, and educational and vocational goals. Thus, an individual's personality pattern is identified by his or her resemblance to each of the six orientations. An individual's personality type is said to be reflected by the orientation that he or she most clearly resembles. The following are the descriptions of the theoretical model orientations.

The Realistic orientation is characterized by aggressive behavior, mechanical skill, practical mindedness, physical strength, conventional masculinity, and interest in activities requiring motor coordination rather than those requiring social concerns and sensitivity. The kind of person embodying this orientation prefers to act out problems, to avoid interpersonal tasks, and to seek concrete rather than abstract problem situations.

The Investigative persons prefer to think through rather than to act out problems. They enjoy ambiguous work tasks and evidence a need to understand by thinking through problems. They are characterized as being scientifically inclined, inventive, precise, achieving, independent, shy, and radical.

As the name implies the Social people have social interests. They prefer teaching or therapeutic roles and are responsible, humanistic, and accepting of conventionally feminine impulses. Social people not only seek close interpersonal situations but are skilled in their interpersonal relations. These people tend to avoid intellectual problem solving, physical activity, and highly ordered activities.

Conventional persons prefer structure and order in verbal, numerical, and behavioral activities. They tend to avoid ambiguous situations and problems involving interpersonal relationships and physical skills. The Conventional style suggests a concern for rules and regulations, high self-control, and strong identification with power and status.

The Enterprising people are verbally skilled, dominant, sociable, adventurous, and persuasive. They strive to acquire power and status. These people place high value on being influential in public affairs and thus prefer to be community leaders, experts in finance and business, or the like.

The Artistic people have a high need for original and individualistic expression. They tend to be asocial, intraceptive, emotional, and more conventionally (or stereotypically) feminine than masculine. Such people dislike structure and show a limited amount of self-control. They prefer dealing with environmental problems through their artistic expression.

To assess an individual's personality orientation, Holland has developed the Vocational Preference Inventory (VPI). The rationale for the development of this instrument is based on the assumption that preferences for occupations are expressions of personality. To the degree an individual prefers a large number of occupations associated with a particular personality orientation, his favored coping behaviors for dealing with interpersonal and environmental problems may be inferred. In this sense, a person's choice of an occupational title on the VPI tell us something about his or her understanding, motivation, and knowledge of that occupation. Under certain conditions, the inability to make discriminations among occupations is seen to indicate conflict and personal problems. Thus, according to Holland (1965), interest inventories are in effect personality inventories, and an individual's vocational preferences represent a major facet of his or her personality.

In its present form the VPI is composed of 160 occupational titles. It is self-administering; individuals simply record their preferences for occupations on an answer sheet. Although the primary purpose of the VPI is to assess personality, it may also be used as a conventional interest inventory as well as to stimulate occupational exploration by the person taking it (Holland, 1965).

Initially the VPI scales were developed on an a priori basis. The forms and revisions that followed the original instrument were consequences of a series of rational-empirical steps. The sixth revision is composed of 11 scales: the 6 model orientations previously described; the additional scales of Self-Control, Masculinity, and Status; and 2 response set scales entitled Infrequency and Acquiescence (Holland, 1965).

The Self-Control scale measures the inhibition of impulses to act out motivation, thinking, or fantasy. High scorers on this scale tend to be inhibited, constricted, passive, and responsible. Low scores indicate impulsiveness and a tendency to act out.

On the Masculinity scale, high scores indicate frequent choice of conventionally masculine occupational roles. The low scores suggest conventionally feminine choices. This scale may be seen as assessing the degree of a person's identification with the conventional or stereotyped gender roles of our society.

The Status scale purports to assess an individual's concern for prestige and power. In addition, this scale attempts to provide an estimate of the individual's self-esteem and self-confidence.

The Infrequency scale is similar to what might be considered a personal effectiveness scale. Low scorers on this scale have realistic perceptions of the occupational world, report high vocational aspirations, and indicate confidence in their abilities and personality. High scorers report atypical vocational preferences suggesting possible negative self-attitudes.

The primary purpose of the Acquiescence scale is to detect dissimulation. However, in addition, high scores on this scale are considered to indicate a sociable, cheerful, active, frank, and conventional outlook about the vocational world. Low scores suggest an unsociable, passive, defensive, and unconventional outlook.

Validity of the VPI

Holland and others have conducted a number of studies which help to assess validity of the VPI. These studies of concurrent and predictive validity have generally used one of four empirical approaches. One approach has investigated the relationship between personal orientation as measured by the VPI and either other inventories or educational choices (Folsom, 1969; Holland, 1960, 1962, 1963a, 1968; Wall, Osipow, & Ashby, 1967). These studies showed that the scores on the scales of the VPI are moderately correlated with scores on corresponding scales of other inventories (measuring similar constructs). Among the instruments used for purposes of validation have been the California Psychological Inventory; the Edwards Personal Preference Schedule; Barron's Independence of Judgment, Originality, Complexity-Simplicity; and the Strong Vocational Interest Blank. The results generally tend to support the validity (concurrent) and interpretive meaning of the VPI scales.

The second approach has focused on the assessment of the range of personal orientation of a variety of social categories and groups (Fairweather et al., 1960; Holland, 1958). The results of these concurrent validity studies indicate that the VPI scores do differentiate between men and women; between salesmen, advertising, and scientific personnel; between normal, psychiatric, TB patients, and psychopaths; and between psychotic and nonpsychotic patients. In general, the findings suggested that the VPI describes and differentiates among these groups in ways that would be expected given existing knowledge (Holland, 1965).

A recent, significant study by Lacey (1971) has explored the concurrent validity of the VPI for employed males. The sample for the study was composed of 230 male workers in eight different occupational environments. This total sample consisted of six groups matching Holland's vocational models: Realistic—project engineers (N = 29); Investigative—research chemists (N = 31) and computer programmers (N = 29); Social—high school teachers (N = 28); Conventional—actuaries (N = 29); Enterprising—bank executives (N = 30) and insurance company executives (N = 30); and Artistic—college English professors and music teachers (N = 24). Subjects, ranging in age from 35 to 44, had all earned at least a baccalaureate degree and had

accumulated at least 10 years of work experience. They responded to the VPI in the occupational environments in which they worked. The findings revealed that five VPI scales (Investigative, Social, Conventional, Enterprising, and Artistic) successfully differentiated each of the eight occupational groups. Furthermore, two of the nonvocational VPI scales (Masculinity and Status) discriminated among the eight groups. Thus, these data offer additional support for the concurrent validity of Holland's Vocational Preference Inventory.

The third approach has investigated the relationship between VPI scale scores and self-ratings or self-descriptions on traits which the various scales are presumed to measure (Baird, 1970; Holland, 1962, 1963b, 1964a, 1968). In general, these concurrent validity studies indicate that students tended to describe themselves and express life goals that were consistent with their scores on the VPI scales.

The last approach has studied the associations of VPI scale scores with various external criteria (Astin, 1963; Astin & Holland, 1961; Osipow, Ashby & Wall, 1966). In these validity (concurrent and predictive) studies, scores on the VPI were correlated with such criteria as supervisory ratings, occupational status, choice of vocation and major field, and psychiatric or nonpsychiatric status (Holland, 1965). The findings generally show the kinds of relationships between the external criteria (present and future) and the scores on the VPI scale that increase confidence in the validity of the VPI scales.

The results of the validity studies taken together tend to support the interpretations attributed to the scales. However, it should be noted that frequently the magnitude of the correlations is rather low. Even so, the concurrent and predictive validity findings lend some, if not complete, support to the original rationale underlying the development of the inventory.

Reliability of the VPI

The test-retest reliability for each scale of the VPI (third and sixth revisions) has been investigated for student and adult samples. The coefficients of stability, as reported in Table 6, suggest that the VPI has moderate to high reliability (Holland, 1965). In general, the reliabilities are high for samples retested over shorter intervals of time. The 4-year reliabilities which are lower probably reflect to some extent individual and group change over the 4-year period.

Relationships among the VPI Scales

The intercorrelations between the scales of the VPI (sixth revision) were studied for samples of students and employed adults. The intercorrelations for 362 male National Merit finalists and 277 female National Merit finalists are presented in Table 7. As can be seen, the personality orientations assessed by the VPI scales are

TABLE 6

Reliability Coefficients (Retest) for Samples of Students and Adults

	TP Patients	NP Patients	College Seniors	Kansas State Freshmen	National Merit Finalists[b]	
	Males (N=38)	Males (N=96)	Males & Females (N=17)	Males & Females (N=26)	Males (N=432)	Females (N=204)
	4 months[c]	3-4 months[c]	6 weeks[c]	1 year[c]	4 years[c]	
Scales	3rd Rev.	3rd Rev.	6th Rev.	6th Rev.	6th Rev.	
Realistic	73	63	92	86	58	49
Intellectual	74	66	83	65	52	56
Social	82	52	79	76	56	49
Conventional	76	70	74	61	47	45
Enterprising	79	53	78	71	61	51
Artistic	71	59	98	73	61	51
Control	72	70	86	84	52	49
Masculinity	87	55	85	82	53	42
Status	75	60	62	84	48	33
Infrequency	67	71	---	78	41	46
Acquiescence	58	54	---	93	52[a]	27[d]

[a]For this sample, Ac equals the total number of "Like" or "Yes" responses.

[b]For this sample, the fourth revision administered in 1958 was rescored for the sixth revision, or the common items in both forms. The sixth revision was administered in 1962.

[c]Time interval.

Source: J. L. Holland, *Manual for the Vocational Preference Inventory* (6th rev.). Palo Alto, California: Consulting Psychologists Press, 1965. Copyrighted 1965 by Consulting Psychologists Press, and reproduced by permission.

moderately related to one another indicating that the scales are not completely independent.

Summary

Holland has assumed that people can be characterized by their resemblance to one or more model personality orientations. He argues that an individual's personality

TABLE 7

Intercorrelations of VPI Scales (Sixth Revision) for Samples of National Merit Finalists

Scales	Real	Int	Soc	Conv	Ent	Art	Co	Mf	St	Inf	Ac
Real		44	10	33	09	25	38	11	-30	13	47
Int	40		12	21	00	23	16	21	07	28	50
Soc	07	03		29	39	20	-20	28	27	-17	57
Conv	38	12	21		38	03	01	18	16	02	43
Ent	13	08	35	57		31	13	07	37	-12	48
Art	04	20	31	01	26		29	25	16	-22	49
Co	47	17	08	13	-16	09		19	-43	56	36
Mf	34	19	26	26	06	-31	06		15	15	-08
St	14	-04	23	16	24	18	19	08		11	26
Inf	27	-35	-09	04	03	-13	60	10	13		-30
Ac	51	46	47	46	48	46	-37	11	14	40	

Note. Correlations for boys (N=362) are below the diagonal and above the diagonal for girls (N=277).

Source: J. L. Holland, *Manual for the Vocational Preference Inventory* (6th rev.). Palo Alto, California: Consulting Psychologists Press, 1965. Copyrighted 1965 by Consulting Psychologists Press, and reproduced by permission.

type is probably the product of his life history. To assess an individual's personality type, he has developed the VPI. The basic rationale behind the inventory is that preferences for occupations are expressions of personality. If an individual prefers a large number of occupations associated with a personality orientation, this tells something about his ways of dealing with interpersonal and environmental problems. The results of the validity studies on the VPI generally lend moderate support to the meanings attributed to the scales and to the rationale underlying the development of the inventory. The coefficients of stability indicate that the inventory has currently acceptable reliability.

Environmental Models and the Environmental Assessment Technique (EAT)

To predict behavior efficiently Holland argues that it is necessary to assess the environment as well as the person. Therefore, to supplement the personality types

Holland (1966) has proposed six model environments to characterize the physical and social settings in our society. He has defined environmental models in terms of the situation or atmosphere created by the people who dominate a given environment. Thus, for each personality type there is a logically related environment. The following are the descriptions of the hypothetical environments.

The Realistic environment is characterized by demands for explicit, physical, concrete tasks. Expected and frequent behaviors include mechanical responses, persistence, and a variety of physical movements in outdoor settings. Tasks usually call for immediate behavioral action. Therefore, reinforcement generally follows the successful completion of a task. Pressure does not exist for interpersonal skills and for close interpersonal relationships.

The Investigative environment is characterized by tasks that require thinking responses which are not only abstract in nature but also require the use of creativity and imagination. In this environment, work involves ideas and things rather than other people. A minimal pressure for social skills exists; therefore, relationships with others are usually superficial rather than close. Laboratory equipment is frequently used but the occupational requirements are usually not physically demanding (talking, reading, writing and ideational learning). As might be expected, the work setting is usually indoors.

The Social environment requires the ability to interpret as well as to modify human behavior. There is pressure to be interested in communicating with and helping others. Work situations (such as teaching, lecturing, social work, and other forms of helping) generally demand verbal facility with people rather than with things. The work environment fosters prestige but reinforcements tend to be delayed.

The Conventional environment is characterized by tasks that require systematic, concrete, and routine responses. Minimal physical strength is required and the activities are carried out indoors. Because work in this environment is mainly with things and materials, pressure for interpersonal skills is not high.

The Enterprising environment is characterized by tasks requiring verbal responses meant to influence other people. Pressure exists to assume persuasive and supervisory roles. Work situations require such behaviors as directing, controlling, and planning the activities of others. The environment demands an interest in people and things. Social skills are needed because many work situations are people oriented; the environment does not call for the ability to form close relationships, however.

In the Artistic environment, tasks generally require the use of imagination as well as personal interpretation of feelings, ideas, or facts. Personal interpretations are usually evaluated against sensory or judgmental criteria. Although excellence is

valued. the standards of excellence are often defined ambiguously. Work situations usually require intense involvement for long periods of time and draw upon a person's total resources. Some work situations (such as drama) involve close interpersonal relationships; other work situations (such as painting) are completed in isolation.

To assess environments Astin and Holland (1961) developed the Environmental Assessment Technique (EAT). The rationale for the development of this instrument was based on the assumption that a major portion of environmental forces is transmitted through other people. This assumption implies that the dominant features of any particular environment depend on the typical characteristics of its members. Thus, knowledge about the kind of people that constitute a group should reveal something about the climate created in the group. Put simply, a setting inhabited primarily by social workers would be expected to have a different atmosphere than a setting occupied primarily by chemists or accountants.

Because the EAT characterizes an environment by assessing its population, the measurement technique used entails a census of such things as self-reported vocational preferences, academic majors of college students, or occupations of the members of a population. Although, according to Holland, the population may be a college, a hospital, a bank, or the like, the major use of the EAT to date has been to characterize college and university environments (Astin, 1963; Astin & Holland, 1961).

The form of the EAT which has been used to assess college environments (and to assist in the study of individual-environment fit) is composed of eight variables: the total number of students in the college, the average intelligence of the students, a[nd] the six model environments previously described (Astin & Holland, 1961). Institutional size is simply the total enrollment (N) at the institution. Actually the square root of N is used as the measure of size in order to more closely approximate a normal distribution. The intelligence level of the student body may be estimated by using the scores on the National Merit Scholarship Qualifying Test (NMSQT), The American College Testing Program Assessment (ACT), or the College Entrance Examination Board's Scholastic Aptitude Test (CEEBSAT).

The remaining six variables (environmental models) correspond to Holland's six personality types. Vocational preferences or actual major fields or occupations are classified into one of the six model environments. The six scores are calculated by counting the number of students who have expressed vocational preferences or are in college majors consistent with a particular environmental model and/or personality type. The assignment to particular categories is accomplished by using a psychological classification scheme for vocations and major fields developed by Holland (1966, 1968). Each score is expressed as a percentage of the total number of classifiable majors. As an example, a small private college of 1,000 students might be classified into the following environmental models:

Environmental No.	Environment	Number	Percentage
1	Realistic	40	4
2	Investigative	80	8
3	Social	200	20
4	Conventional	30	3
5	Enterprising	100	10
6	Artistic	550	55
		1,000	100

Accepting Holland's theoretical scheme, it makes sense that a student's decision to major in a given field may be used as an index of his or her personality type, and that the dominant type in an environment is informative about the particular climate or atmosphere in that environment. In the above example the environmental code would be represented as 635214. That is, the dominant type in this environment is Artistic, followed by Social. Thus, this environment would be expected to emphasize self-expression and creativity. Work tasks frequently would involve personal interpretation of feelings and ideas. Excellence would be valued, but standards would be vaguely defined. In general, the environment would tend to reward intraceptive, impulsive, and emotional behaviors.

Validity of the EAT

Initial data on EAT's concurrent validity (Astin & Holland, 1961) were gathered using the College Characteristics Index (CCI) (Pace & Stern, 1958). EAT profiles of 335 colleges were obtained. Scores on eight EAT measures were correlated with the ratings of these same colleges by other groups of students (as indicated by scores on the 30 scales of the CCI). In general, the findings supported the validity of EAT. Of the 240 correlation coefficients shown in Table 8, 23% are significant at the .01 level, and 39% at the .05 level. And these correlations tend to make sense. For example, colleges and universities with large percentages of Investigative students tended to be rated low on Deference but high on Fantasied Achievement, Objectivity, and Understanding. Thus, Investigative environments seem to reward independence of thought and action, the need to achieve, and the need to analyze and understand.

Astin (1963) further studied the concurrent validity of the EAT by designing specific items to test the proposed interpretations of each EAT variable. For example, to test the notion that the Social orientation stimulates social and interpersonal activity, the following item was used: "There is a good deal of emphasis on parties and dating." The final questionnaire contained 18 items asking the students to describe their college environments and 21 items asking them to describe the effects of their 4 years at the college. National Merit Scholarship

students who were seniors at 76 institutions responded to the questionnaires. In general, the results of this study are similar to those in the earlier study just described (Astin & Holland, 1961). The responses to 14 of the 18 environment items were statistically significant in the predicted direction. Of the 144 correlations among the EAT variables and the 18 ratings of college environment, 81 (56%) were significant. In addition, 15 of the 21 college effects items were significantly related to at least one EAT scale; of the 168 correlations computed between the EAT variables and college effects ratings, 57 (34%) were significant. However, the intelligence level of students was appreciably correlated with all EAT variables. Again, the results offer support to the concurrent validity of EAT as a method for assessing the college environment.

In his study, Astin (1963) refined the EAT by weighting each vocation or major for the two models it resembles. Previously, each major field was classified into only one environment model. Astin attempted to combine the attributes of more than one environmental model. For example, a psychology major had previously been counted in the Social model. Using the method of differential weighting for a psychology major, the score is .25 for the Investigative model and .75 for the Social model.

In more recent studies, Astin has been less concerned about validating the EAT. He has studied the variability in classroom environments across different fields of study (Astin, 1965a). Students (N = 4,109) rated introductory courses in 19 fields at 246 institutions. Differences among the 19 fields on all 35 ratings were statistically significant and in the expected directions. These findings suggested that the EAT is able to discriminate among various classroom environments.

Another interesting study focused on identifying institutional differences using the EAT scales and other variables. In this study Astin (1962) empirically characterized institutions of higher education by means of a factor analysis of 33 institutional variables. These variables included the EAT scales, financial resources of the schools, and faculty and student characteristics. The sample consisted of 335 accredited, 4-year degree-granting institutions. An especially noteworthy finding of the study was that four of Astin's factors turned out to be similar to four of the eight EAT variables. The study suggested that the census of a college provided by the EAT in effect gives information about a variety of institutional characteristics. Indeed, in two books (Astin, 1965b, 1968), it is shown that the EAT variables are related to a broad range of student as well as institutional characteristics.

In sum, the few existing validity studies do lend support to the concurrent and construct validity of the EAT. In essence, these studies suggested that a census of the kinds of people found in college environments provides a certain amount of information about the environmental climates of the colleges.

Reliability of EAT

Astin and Holland (1961) studied the test-retest reliability of the six EAT variables intervals of 1, 3, and 6 years using a random sample of 31 institutions from the

TABLE 8

The Relation of Eight Environmental Measures to the College Characteristics Index at 36 Institutions

CCI scales	Size of student body	Intelligence of student body	Personal orientations [a]					
			Realistic	Intellectual	Social	Conventional	Enterprising	Artistic
Abasement	20	-37	38	-29	04	11	24	45
Achievement	59	64	-20	33	-22	-35	42	35
Adaptiveness	14	-55	14	-39	26	13	-25	20
Affiliation-Rejection	35	08	-21	38	-01	-07	05	16
Aggression-Blamavoidance	64	09	45	09	-25	08	38	58
Change-Sameness	-06	17	20	14	-14	-02	10	09
Conjunctivity-Disjunctivity	-19	06	-06	16	-07	-24	22	12
Counteraction-Infavoidance	58	49	06	28	41	-29	11	19
Deference	54	-63	26	55	20	30	38	26
Dominance	-19	21	-21	32	08	-02	03	09
Ego Achievement	-02	19	-34	-13	38	12	15	24
Emotionality-Placidity	33	23	-25	21	-14	18	20	14
Energy-Passivity	-55	48	-05	31	-35	-42	28	33
Exhibition-Infavoidance	53	-45	-14	33	43	36	15	03
Fantasied Achievement	-55	49	-32	46	-17	-21	35	38
Harmavoidance	-39	26	-50	04	21	-14	55	56

Humanism	-28	55	-81	23	25	07	79	64
Impulsion-Deliberation	27	00	11	28	-08	23	-28	-40
Narcissism	49	-36	-17	-43	59	01	01	18
Nurturance-Rejection	-03	-26	-37	-18	39	-06	22	46
Objectivity	-42	68	-26	46	-24	-26	40	31
Order	28	-51	-05	31	36	15	-10	03
Play	47	-60	25	-34	35	04	-36	30
Pragmatism	52	-67	73	-32	-08	02	-73	66
Reflectiveness	-29	50	-62	16	14	01	64	54
Scientism	-18	31	33	38	-43	-08	-22	48
Sentience	-28	47	-70	10	31	13	71	69
Sex-Prudery	54	-40	-22	-24	53	15	01	06
Succorance-Autonomy	-01	-28	-09	10	14	24	-14	13
Understanding	-58	70	-28	46	-23	24	41	33

Note.– $r_{05} = .33$; $r_{01} = .43$. Decimal points omitted in table.

[a]The percentage of college majors falling in each class.

Source: A. W. Astin and J. L. Holland, The Environmental Assessment Technique: A Way to Measure College Environments, *Journal of Educational Psychology*, 52, 1961. Copyrighted 1961 by the American Psychological Association and reproduced by permission.

original sample of 335. Scores on the six variables were obtained for the graduation years of 1952, 1955, 1956, and 1958. The coefficients of stability indicated high retest reliability over a 1-year interval. The coefficients ranged from .81 to .99. In addition, the coefficients for the 3- and 6-year periods suggested high retest reliability for all but the Investigative variable. These data indicated that curricular differences among institutions (environments) tend to be quite stable from one year to the next.

Relationships among the EAT Variables

The intercorrelations among the eight EAT variables have been computed using a sample of 335 institutions (Astin & Holland, 1961). Twenty-four of the 28 correlations were significant at the .05 level (see Table 9). From these intercorrelations, Astin and Holland identified two main clusters of variables. The first cluster is composed of Intelligence, the Investigative environment, and the Enterprising environment. The second cluster consists of the Realistic (negatively weighted), Enterprising, and Artistic environments. In general, the intercorrelations suggest some overlap among the variables.

Summary

According to Holland, predictions about human behavior can be made more effectively by assessing both the individual and the environment in which he participates. Therefore, to supplement the personality types, he has proposed six model environments the assumption being that for each type there is an analytically related environment. To assess these actual environments, Astin and Holland developed the EAT. The basic rationale underlying the technique is that a major portion of existing environmental forces is transmitted through other people. Consequently, a census of the kinds of people found in an environment suggests something about the climates they have created. In general, the results of appropriate studies suggest that this method for assessing college environments possesses moderate concurrent and construct validity and high test-retest reliability.

Research Directly Testing Theoretical Predictions

Development of Personal Orientations

For Holland, an individual's personality type is the product of his or her life history (e.g., heredity, past and current cultural and personal forces, and the past and current physical environment). More specifically, in his view, the social pressures in early adolescence and childhood experiences with parents are particularly important to the development of a personality type. In an attempt to explore how personality types develop, Holland (1961, 1962, 1966) has investigated various parental behaviors.

TABLE 9

Intercorrelations of EAT Variables
(N = 335)

	2	3	4	5	6	7	8
1. Size	-.09	.26	.28	.06	.26	-.25	-.29
2. Intelligence	--	-.08	.41	-.36	-.27	.48	.34
3. Realistic orientation	--	--	-.24	-.37	-.17	-.46	-.57
4. Investigative orientation	--	--	--	-.40	-.17	.38	.16
5. Social orientation	--	--	--	--	-.23	-.32	-.01
6. Conventional orientation	--	--	--	--	--	-.12	-.30
7. Enterprising orientation	--	--	--	--	--	--	.45
8. Artistic orientation	--	--	--	--	--	--	--

Note. $r_{.05} = .11$; $r_{.01} = .14$.

Source: A. W. Astin and J. L. Holland. The Environmental Assessment Technique: A Way to Measure College Environments, *Journal of Educational Psychology*, 52, 1961. Copyrighted 1961 by the American Psychological Association and reproduced by permission.

Holland, in his theory, assumed that persons with the same dominant personal orientations have similar family backgrounds. In order to explore the plausibility of this assumption, Holland (1962) hypothesized that there would be a relationship between a student's high point code on the VPI and the following variables: father's occupation, father's and mother's education, student's birth order, and number of children in the family. In a sample composed of students and parents in the 1958 group of National Merit Scholars, it was shown that father's occupation was related to the VPI codes for male students. Students with a given personal orientation tended to have fathers whose current occupations were consistent with the corresponding personality type. For female students, however, none of the findings was significant.

In other studies (Holland, 1961, 1962) fathers' and mothers' attitudes about their children were correlated with the six VPI scales. The Parental Attitude Research Instrument (PARI) was used to measure the mothers' attitudes. Fathers were asked to rank goals and hopes for income that they held for their children. In a sample composed of the 1959 National Merit Scholars and their parents, the obtained relationships, albeit low in magnitude, did suggest certain associations between personal orientations and parental attitude.

Thus, fathers of students with Realistic orientations tended to want their offspring to be ambitious while mothers generally expressed unsociable and suppressive attitudes. Fathers of students with an Investigative orientation wanted them to be curious and mothers tended to be permissive and passive. Students with a Social orientation had fathers who wanted them to be self-controlled. Conventionally oriented students had fathers who would have liked them to be happy and well adjusted and to attain a high income; their mothers had authoritarian attitudes about child rearing. Fathers of students with an Enterprising orientation would have liked them to be popular, happy, and well adjusted; their mothers tended to exhibit authoritarian attitudes. Finally, Artistic students had fathers who wanted them to be curious and independent while their mothers tended not to be particularly authoritarian. The findings were stronger for males than for females.

Although the above data are interesting in themselves, they do not clearly indicate that parental attitude factors are a major influence on the pattern of personal orientations an individual develops. However, the findings do suggest that parental behavior can create environments which do exert certain specific impacts on individuals' personal development.

Person-Environment Congruency

Personal orientations and congruent environments. According to the theoretical orientation under analysis, if an individual possesses an accurate perception of self and reality he or she is more likely to select environments congruent with his or her personal orientation. Moreover, these congruent person-environment relations should tend to stimulate achievement, satisfaction, and reinforcement of successful coping behavior; thus, the prediction can be made that self-perceptive individuals tend to choose occupations (environments) consistent with their personal orientations. For example, Realistic people (who are aware of their selves and the reality around them) would be expected to choose careers and/or major fields in a Realistic occupational environment. Extant research in this area tends to support predictions such as this one.

For a 1958 sample of National Merit Scholars (males and females) Holland (1962) studied the relationship between career choice and VPI codes. He was interested in the relationship between personal orientation and the occupational environment of the field for which an individual stated a preference. The categorization of career field was done intuitively by two judges. Consistent with theoretical expectations the findings showed that males and females tended to select careers in congruent fields or environments. More specifically, a majority of the individuals with a Realistic, Investigative, or Social orientation made congruent choices. Enterprising students, however, selected many careers in the Realistic area; and the findings for the Conventional and Artistic groups did not fit theoretical expectations. Artistic students chose most of their careers in the Investigative area. Conventional students selected a high percentage of Investigative careers. Holland did find that second and

third vocational choices seemed to be in fields consistent with the individual's major personal orientation. In general, his findings were similar for males and females.

In another study Osipow, Ashby, and Wall (1966) tested Holland's theory using a sample of typical college students (males and females). In order to identify major personal orientation, subjects were asked to rank the six personality descriptions representing Holland's six types. Information about the occupational preferences of each student was available. The data revealed that large proportions of students made their choices in a manner consistent with Holland's theory. For example, occupational choices for the Realistic, Investigative, and Enterprising types were in environments consistent with major personal orientations. Not consistent with theoretical expectations, however, most occupational choices of the Conventional type were classified in the Realistic and Investigative categories. The Social and Artistic types were not studied because of small sample sizes.

More recently, Holland (1968) has explored the validity of his theory using a large sample of typical college students. One of his purposes in doing so was to investigate the relationship between personal orientation and occupational environment. To accomplish this task, Holland used two methods of measuring personal orientation: the VPI and the student's initial expressed vocational choice. The results showed that the percentage of correct predictions of a student's final vocational choice from his first choice made 8 months earlier varied from 63.2% to 71.2% for men. The parallel percentage of correct predictions of a student's final vocational choice—in this case from his or her highest score among VPI scores obtained 8 months earlier—varied from 21.5% to 51.4%. Thus the findings suggested that a student's self-report is more effective than his or her responses on the VPI. However, both methods of assessing personality types do have predictive validity and are consistent with theoretical expectations. In general, the findings for women are similar to those for men.

Person-environment congruency and student-institutional interactions and stability. A number of studies have tested the hypothesis that a student is more likely to maintain his vocational choice if he lives in an environment congruent with his personal orientation. The research strategy of these studies is to characterize students and colleges in terms of personality types and environmental models and then to attempt to assess the institutional influences.

In the first of these investigations, Holland (1962) studied a group of National Merit Scholarship students planning to attend a number of colleges. He classified each of the colleges attended by subjects in his sample—97 in all—into one of six model environments. These classifications were composed of 2-digit codes. The personality type with the highest percentage of majors in the freshman class determined the high-point code of that institution. The second most common personality type determined the second digit in the institutional code. The

hypothesis tested was that students in congruent environments would change major field less frequently than students in incongruent environments. Thus, a student with a high-point code of Realistic or Investigative (science) who attended a college also coded Realistic or Investigative was considered to be in a congruent environment; and it was expected that this or any other congruent environment would tend to reinforce the student's initial major field choice. On the other hand, a student with a code of Social, Conventional, Enterprising, or Artistic (nonscience) in an environment coded Realistic or Investigative, being in an incongruent environment, would be expected to change his or her major. In general, the findings did not support these predictions.

In a further exploration of the congruence stability hypothesis, Holland (1963) used a 4-point stability score. One point was allocated for each of the following characteristics: having a high-point code congruent with the college; possessing a consistent college code; reporting a science major; having a consistent 2-digit code. Thus, a student meeting all of the above criteria received a score of four. The students were divided into changers and nonchangers of a major field. For a sample of 238 males, a strong relationship was found between the 4-point stability scores and stability of major field choice. No students scoring four changed major field, and only 13 of the 53 students scoring three changed major field. These findings suggested that person-environment congruency does contribute to the stability of choice of major field.

Recently Holland (1968) has studied congruency and stability of vocational choice using a sample of typical college students (males and females). In this study, student-expressed vocational choice was used to define his or her personality. Stability of vocational choice was indexed by the relationship of first to last vocational choice 8 to 12 months later. Two samples were used: the first was composed of students from 6 colleges, the second of students from 22 colleges. The percentages of stability for the six personality types and the six EAT scores were intercorrelated for each college. Although 41 out of the 50 correlations were positive, only 5 of them were statistically significant. The sheer number of positive correlations did suggest, however, that a student increases the likelihood of maintaining his present vocational choice if he attends a college in which his choice is congruent with the most popular fields in that environment. To further test the congruency hypothesis, Holland (1968) correlated the percentages of vocational stability for each type with the rank of the corresponding environmental model across colleges. Only 4 of the 20 correlations were statistically significant, but all 4 were in the expected direction. In total, the findings offer moderate support to the congruency hypothesis. Students are somewhat more likely to maintain their initial vocational choices if these choices are similar to the dominant or model choice in the college environment.

In this same study Holland (1968) also tested the hypothesis that homogeneous environments are related to vocational stability. Correlations by sex for two

samples were computed between the percentage of stability for all students at a college and the homogeneity of a college's environment. (Homogeneity was operationally defined by the percentage of difference between the largest and the smallest EAT scores.) All four of the correlations were positive, but only one was statistically significant. Although more data are clearly needed, it does seem to be true that students tend to maintain their original vocational choice if they attend colleges that have only one or two dominant environmental presses; on the other hand, they tend to change their vocational choices if they attend colleges with flat profiles in four or five weak environmental presses.

Two other studies may be considered relevant to the congruency/stability area of study. One of these studies (Astin, 1965) examined the effects of various college characteristics on the career choices of 3,538 male students of exceptional ability over a 4-year period. Student input data were collected at the time they entered college. The students (attending 73 institutions) responded to a mail questionnaire concerning future vocational and educational plans and other information. Environmental data were composed of the eight EAT variables and the three institutional factors (Affluence, Masculinity, and Homogeneity) previously identified by Astin (1962). Student output (criterion) data consisted of each student's career choice at the time of his or her graduation from college (as determined by a questionnaire). Career choices were classified as one of four of Holland's six types: Realistic, Investigative, Social, and Enterprising. (The Conventional and Artistic types were not used because of the low proportions of students with career choices in these classes.) The Realistic and Enterprising types' stability of vocational choice was associated with congruency of a student's vocational choice and the corresponding EAT variable. For example, a student's desire to pursue a Realistic type of career was increased if he or she attended a college with a high Realistic press. Thus, for these persons at least, it seemed that they tended to become more like their environments.

Taken together, the research reported in this section tends to offer some, though hardly overwhelming, support to the congruency and stability hypothesis. Students do tend to maintain their vocational choices if they live and function in congruent environments. But the results are certainly not conclusive.

Person-environment congruency and personal adjustment. The studies in this area have been primarily concerned with identifying differences on personality variables (related to vocational and personal adjustment) between students who are enrolled in educational programs congruent with VPI scores and students enrolled in educational programs incongruent with VPI scores. The findings of two of the three following studies indicate some degree of positive relationship between person-environment congruency and personal stability.

A study by Walsh and Russel (1969) focused on differences reported in personal justment problems between freshman students (male and female) who made a ngruent college major choice and those who made an incongruent one. Personal

adjustment was defined operationally by scores on the Mooney Problem Checklist (Mooney & Gordon, 1950). The congruent and incongruent choice groups were defined according to Holland's theory. A congruent college major choice was considered to be one consistent with the individual's primary personality type as identified by the VPI. For example, a student reporting a major choice (political science) consistent with his or her peak score (Enterprising) on the VPI was labeled congruent. An incongruent college major choice (forestry) was one that was not consistent with the primary personality type (Social) of the student. The findings of the study showed that subjects who made a congruent college major choice reported fewer personal adjustment problems than subjects who made an incongruent choice. This finding was significant for males and approached significance for females.

Two similar studies (Walsh & Barrow, 1971; Walsh & Lewis, 1972) explored the differences reported on personality variables between freshman students who made congruent and incongruent college major choices. In the Walsh and Barrow (1971) study the personality variables were operationally defined by the use of the California Psychological Inventory (Gough, 1957). In this study a congruent choice was defined as one that was consistent with the individual's primary or secondary personality type as identified by the VPI. The major result of this study was that congruent or incongruent person-environment relations tended not to be associated with the personality variables.

However, the findings of the Walsh and Lewis (1972) study were not necessarily consistent with the above negative results. In this study, the personality variables were operationally defined by the Omnibus Personality Inventory (Heist & Yonge, 1968). Students in the congruent groups were identified by the consistency between their college major-field choices and their primary personality types determined by the VPI; likewise, the incongruent groups were composed of students who reported majors inconsistent with their primary personality types. The undecided groups consisted of students who did not report a major or who indicated an undecided status. In the analysis of the main effect of groups, four personality variables were found to be statistically significant (Impulse Expression, Personal Integration, Anxiety Level, and Response Bias). Congruent males tended to be socially accepted, logical, analytical, in a state of well being, less anxious, and less impulsive than the other groups (particularly the undecided and incongruent male groups). The undecided males tended to feel socially alienated, tense, impulsive, imaginative, and distrustful in their relationships with others. The incongruent males reported feelings of isolation, loneliness, and impulsiveness. Thus, at least for congruent males, the results of this study were consistent with and support Holland's notion that congruent person-environment relationships are conducive to better maintenance of personal stability and greater personal satisfaction.

Person-environment congruency and self-reported change. Holland and Nichols (1964) predicted that students would remain in a field of study if they possessed

attributes similar to those of the typical student in that field. To explore this prediction the authors studied changes in major-field plans over a 1-year period. They initially assessed a sample of National Merit Finalists in high school in terms of their initial preferences for vocational field, interest, personality, and aptitudes. Students were again assessed at the end of their freshman year in college. In general, the findings showed that remaining in a given field appeared to be associated with having personal attributes of typical students in that field; those leaving a field generally tended to have dissimilar attributes than those of the typical student.

Other research suggested that students remaining in a field tend to report personal change in directions consistent with the model environment. Put simply, people tend to become more like their environments (Astin, 1965). Holland's theory suggested a developmental relationship between the individual and his or her environment. Two recent studies (Walsh & Lacey, 1969; 1970) explored this developmental relationship by using students' self-reported change during the course of college. These studies attempted to determine if college students (senior males and females) assigned to one of Holland's types (using college major as the criterion) perceived themselves as having changed in a direction consistent with the profile of that type. Ten college major groups represented the personal orientations for females and six groups represented those for males. The college major groups were classified according to Holland's (1968) scheme. Separate scales were constructed for males and females based on attributes that effectively discriminated among the personal orientations. Each subject reported the change he or she perceived in himself or herself on each attribute since his or her freshman year. For males, students in three college major groups (engineering, chemistry, and fine arts) perceived themselves to have changed in a direction consistent with the profile of the respective personality orientation (Realistic, Investigative, and Artistic). Female students in Investigative and Artistic environments (the sciences and music education) reported change in directions consistent with those environments. Also, the business education group perceived themselves as changing in a direction consistent with the profile of the Conventional orientation. In general, then, the findings tended to support the notion of a developmental relationship between the individual and his environment beyond the formative and adolescent years. The environment to some extent seemed to have a molding effect.

Another study (Walsh, Vaudrin, & Hummel, 1972) examined the developmental relationship between the individual and his environment for students with limited exposure to the environment. The prediction was that reported change during the first two quarters in college would not be very great. Subjects in this study were third-quarter freshman males and females, each assigned to one of Holland's personality types (using preferred college major as the criterion). Seven college major groups represented the personal orientations for males and nine groups represented those for females. For each attribute, each subject reported the change he or she perceived in himself or herself since entering the university. For males, the students in two college major groups (chemistry-physics and fine arts) perceived change in a direction which may be interpreted as consistent with the profile of the

respective personality orientation (Investigative and Artistic). For females significant findings were obtained on two scales (Investigative and Conventional). The findings for these groups suggested an early developmental relationship between the individual and his environment. These findings take on increased meaning when they are compared to those of another analysis in which freshman groups were compared to same-named senior groups (Walsh & Lacey, 1969; 1970). The senior groups reported more change consistent with their personality types when compared to the freshman groups. Thus the pattern of these various results across studies suggests that the extension of certain personal characteristics is associated in part with the amount of time spent in a particular environment (such as college major).

Person-environment congruency and satisfaction. Morrow (1971) has studied person-environment congruency and satisfaction. Having assigned students to a personality type on the basis of their responses to Holland's VPI, those with college major choices consistent with the dominant VPI score were labeled congruent. Satisfaction was assessed by means of a questionnaire about students' feelings regarding their college majors. The findings tended to support Holland's contention that congruent person-environment relationships are associated with satisfaction.

In another study, Williams (1967) explored the reported degree of conflict among congruent and incongruent freshman male roommates. All entering students responded to the VPI. Williams identified two groups of students (an inconflict group and a group with no evidence of conflict). Roommate pairs were assigned to the conflict group on the basis of the judgments of housing staff. Both the conflict and nonconflict groups were composed of 39 pairs. The findings showed that congruency of student VPI codes is positively associated with lack of conflict. The most common pattern of VPI codes for inconflict students was that of Investigative-Enterprising.

Perhaps the most definitive work in the area of congruency and satisfaction has been accomplished by Holland (1968). To assess satisfaction, students (from two college samples) checked one of the following responses:

1. This is only a fair college, and there are many others which would probably suit me better.
2. This is a good college for me, but there are a few others that I think are better.
3. This is the best possible college for me that I know of.

Each of the fall sample students reported two satisfaction ratings: the initial response and the final report 8 months later. Similarly, each of the spring sample students reported two ratings: the initial response and one after a 12-month interval. Personality type was defined by a student's choice of college major. For the

men, the correlations did not support the congruency-satisfaction hypothesis: satisfaction with college tended to be associated as much with incongruency as with congruency. The findings did tend to support the hypothesis for women, however. Congruency of female students and college environment was associated with greater reported satisfaction: 17 out of 25 pairs of correlations for women for initial and final satisfaction increased over the 8- and 12-month time intervals.

To examine the homogeneity-satisfaction hypothesis Holland (1968) computed correlations between the average final satisfaction score for all students at a college and the homogeneity score for their college environment. In general, he determined that students were less likely to be satisfied in environments characterized by a dominant choice or a homogeneous student body. In positive terms, the suggestion was that students will probably be more satisfied in environments characterized by heterogeneously patterned profiles. Such profiles tend to be relatively flat and have about equal percentages of individuals in each subenvironment.

In summary, Holland's results (1968) suggest two (still tentative) theoretical rules about congruency and satisfaction: students tend to be more satisfied the more closely they resemble the dominant pressure(s) in their environment; students will probably report more satisfaction in colleges that exhibit heterogeneous profiles. Assuming the validity of these propositions, the more satisfied student is probably attending a college with a heterogeneous profile and resembles the dominant press in that profile. Conversely, the most dissatisfied student is most likely attending a college with a homogeneous distribution of types and resembles the least dominant pressure(s) in that profile.

Other Relevant Research

Person-environment congruency and achievement. Very few studies have examined the relationship between congruency and achievement. In one research, Holland (1963) characterized students and colleges in terms of personality type (using the Strong Vocational Interest Blank) and environmental models (using the EAT) and then assessed achievement of individual students. To measure achievement in three areas (leadership, scientific, and artistic), students responded to achievement scales at the end of their senior year in college. Examples of items on the leadership scale are having been elected to one or more student offices, having initiated a student or social organization, or having received a leadership award. The scientific achievement scale was composed of six items. Some examples are having received a research grant, having received a scientific award, and having published a scientific paper. Some items on the artistic scale are having won a speech or debate contest, having had roles in plays, having been a regular performer on radio or TV, and having composed music. Holland compared the achievement of students with "appropriate" and "inappropriate" personality types attending congruent or incongruent colleges. He predicted that congruency would be positively associated with achievement. For men, the findings revealed that artistic

and leadership achievement (but not scientific achievement) was positively related to congruency. None of the results was significant for women, however. Then, there appears to be some relationship between congruency and achievement, but the evidence is certainly not conclusive.

Person-environment congruency and stability. Brown (1968) determined stability of vocational choice was associated with living in a residence hall with students having similar college majors. His study was designed to explore the effects of having college residence hall floors numerically dominated by students with similar academic majors. Congruency was defined in terms of scientific and nonscientific types. Room assignments were arranged so that the ratio of freshman science students to freshman nonscience students was 4 to 1 on two floors of a residence hall. Two other floors in the hall also had the same ratio (4 to 1), but, in this case, of nonscience students to science students. The results showed that a significantly greater proportion of either type of "minority" group changed their majors to fields similar to those of the "majority" group on their hall floor. Even if the minority group students did not change their major, they on the average did become less certain of their vocational goals during the school year. It may be noted that, based on Holland's theoretical terms, science majors resembled the Realistic and Investigative types and the nonscience types resembled the remaining types.

Person-environment congruency and satisfaction. Rand (1968) has studied the "goodness of fit" hypothesis. The basic proposition behind his work was that a student will tend to be more satisfied if he chooses a college with a student population similar to his personality and interests. His sample was composed of 24 colleges of 7,257 students of both genders. Although the students responded to the complete American College Survey, only selected variables from this survey were used in his study. Measures which were selected included the VPI, the ACT Test Battery, and the Student Orientation Survey Form C. Satisfaction with the college was assessed by a 3-point rating scale (very satisfied, satisfied, and dissatisfied). In general, the findings of the study suggested that the relationship between satisfaction and congruency is small. Student satisfaction with choice of college was only minimally related to the extent to which certain individual characteristics matched those of others at the school. In contrast, Brown (1968) in the study previously mentioned found stronger and more positive results. As noted, he explored the effects of having college residence hall floors numerically dominated by students with similar academic majors. Congruency was defined in terms of scientific and nonscientific types. The results of his study showed that general satisfaction with college was positively related to living in a residence hall where the majority of students had similar college major-field choices.

College major change and personality development. In a recent study Elton (1970) explored the hypothesis that change in college major will have an impact on personality development. In his study, he investigated the hypothesis that males who leave engineering will report personality change different from those

students who persist. A second hypothesis dealt with developmental differences between engineers and a sample of males in a 2-year college. The sample in the study consisted of three groups: 27 male students who transferred to the College of Arts and Sciences after completing two semesters in the College of Engineering, 25 male students who completed four semesters in engineering, and 22 male students who were enrolled in the Ashland Community College 4-year college transfer program. All students responded to the Omnibus Personality Inventory (OPI), Form C, in 1965 and again 2 years later. By comparison of the factor change scores between the groups, the findings indicated that the transfers to Arts and Sciences tended to become more realistic, nonjudgmental, intellectually liberal, and skeptical of orthodox religious beliefs than the other groups. The results for the nonauthoritarianism factor are particularly consistent with Holland's proposition that personality orientation is developmentally associated with the environment. Seemingly paradoxically, the Ashland students reported the largest variability in personality development. To some extent, however, this finding was expected because these students were less influenced by faculty, peer groups, and academic programs than were students actually enrolled in a specific college major. This particular finding, too, seemed to be consistent with Holland's theory. In short, these results lend additional support to the hypothesis that change in college major has an impact on personality development. Put more broadly, there does seem to be a developmental relationship between the individual and his or her environment.

Summary

The model types and environments constitute the core of Holland's theory. The research testing the theory has primarily used the operational definitions of the model types and environments. The findings suggest that the operational definitions (VPI and the EAT) of the core concepts of the theory are reliable and valid. Also, the data as reported in this section support the theoretical frame of reference of the approach, although they are not altogether conclusive. In development terms, results of the existing research suggest certain associations between parental behavior and individuals' personal orientations. In addition, the extant findings indicate that to some extent individuals tend to choose environments consistent with their personal orientations. Finally, the evidence suggests that congruent person-environment interactions tend to stimulate satisfaction, certain kinds of vocational as well as personal stability, and (to a lesser extent) actual achievement.

Evaluation

In its original formulation, Holland's assertions were primarily based on "arm chair" theorizing and speculation. As data have become available, however, he has revised some of his specific propositions and definitions in light of the empirical evidence. After our review of this empirical research, it seems that the theory holds up rather well. It must be said, however, that most of the initial studies testing the

theory have been conducted on atypical samples (exceptionally talented high school and college students) studied over relatively short periods. Thus, a need clearly existed to study more representative samples over longer periods of time. Holland (1968), in fact, has recently used a large sample of typical college students in a longitudinal study; and three other studies (Ashby, Wall, & Osipow, 1966; Osipow, Ashby, & Wall, 1966; Wall, Osipow, & Ashby, 1967) have also used such samples. It is encouraging that the findings of these four studies generally support the theory. However, the question still remains about the relevance of the theory for the graduate student population, the noncollege population, and the older population.

Research based on the theory seems to support the existence of the personality types and environmental models as elaborated in the original theoretical formulation. The results of a number of studies lend support to the theoretical interpretations given to the types and models. Although existing evidence further suggests a developmental relationship between personal orientations and parental behavior or family environments, Holland has had some difficulty in explicating and substantiating the relationships in this area. In any event, data do support the prediction that individuals tend to choose environments consistent with their personal orientations. And, although the congruency research is limited, the extant evidence indicates that congruent person-environment interactions are conducive to personal and vocational stability as well as individual satisfaction. A few studies suggested a relationship between congruency and vocational and academic achievement, but the findings are not very clear. All in all, a need does exist for interaction research using the same sample of people over more extended periods of time.

Another limitation of the theory, mentioned by Holland (1966) himself, is that it does not as yet have much to contribute to the study of individual change and learning. Pertaining to change, Holland (1966) does suggest that certain personality types tend to be more susceptible to change than are other types. Types of people tend to vary in their sensitivity to environmental pressures. According to his theory, it is sensible that the individual and even the environment seem to be subject to change for a number of reasons; but at present, the exact nature and process of these changes remain an empirical question. In regard to learning, Hill (1960) proposed that learning theory may be applied to the study of acquired values and interests. He is of the opinion that a reinforcement framework would not only simplify terminology but also would stimulate more precise study. Yet the fact remains that Holland's theory contributes little to learning theory in any direct way.

A further limitation is that the theory explains very little about the underlying process of personality development. Thus far Holland has not been able to identify the developmental process of the personal orientations. Some evidence of a causal relationship between personal orientations and family environments does exist, but this evidence is at best only suggestive.

An additional shortcoming involves the applicability of the theory to women. One problem involved is the nature of the present form of the VPI: many of the occupational titles are not appropriate for women. Moreover, as Holland recognizes, the theory itself needs to be revised to account more adequately than it currently does for the vocational development of women. It appears, not too unsurprisingly, that the vocational development, behavior, and goals of women differ from those of men which suggests a need for analytically independent formulations for men and women. Holland, however, has not specified the exact directions that these necessary theoretical modifications might take (Osipow, 1968).

An important question is whether the theory has attributes which make it sound. As detailed above, the theory does have limitations which affect its comprehensiveness. And, as Holland further maintains, he has neglected economic and sociological influences upon behavior. Initially he was interested in vocational choice, but the current focus now is on behavior in general. Currently, he believes that more effective predictions about human behavior can be made by assessing the individual and the environment.

The theory rates high on the clarity and explicitness of the theoretical assumptions and concepts. Although the assumptions of the theory are consistent, the logic may be questioned. Holland believes that interests are a reflection of personality. It is true that vocational preferences, expressed interests, and personality do relate to one another, but the intercorrelations are modest. Thus, the evidence supporting the supposition that interest inventories are personality inventories is certainly not conclusive. Next, the theory seems adequate on the criterion of parsimony of the concepts introduced to describe and explain behavior. However, for the most part, the theory is primarily descriptive and consequently low on explanatory power. As one example, the theory does not really explain the development of the personality types. In regard to known empirical findings, Holland's work is inclusive. He has drawn upon the work of a number of associates such as Strong (1952), Kuder (1960), Pace and Stern (1958), and others. Not only is the theory testable, but it has in fact stimulated a great deal of research. Evidence indicates a certain degree of predictive power using the established personal orientation. Moreover, data suggest that congruent person-environment relations to some extent tend to stimulate personal performance in certain areas. On the other hand, no work has been able to describe the development of the personality types. Other evidence indicates that the personality types and model environments are not mutually exclusive and independent classes. In spite of mixed findings such as these, Holland's work seems to be of heuristic and practical value—not only in the area of vocational development but also in people-environment interaction research.

The theory is operationally defined by the Vocational Preference Inventory (VPI) and the Environmental Assessment Technique (EAT). Holland believes that vocational interests are an expression of personality. Therefore, he uses self-reported vocational interests assessed with the VPI to identify the personality

orientation of the person. The environment is defined in terms of the typical characteristics of its members. The measurement technique used (the EAT) entails a census of the self-reported preferences and behaviors of the members of a population. This technique does not, however, assess the *perceived* environment. Moreover, EAT data tell us little about how an environment is reacted to by its participants.

What does the future seem to hold for this theory? Holland (1966) asserts a need for researchers to rigorously study the personality types and their hypothetical attributes, the model environments and their hypothetical attributes, the life histories, and the interaction of people and environments. There is a clear necessity for study and collection of normative data on a variety of noncollege groups of young and old membership. The nature of development of the personal orientations is obviously a significant research question. Generally speaking, additional research will hopefully create a wider data base from which the theory may be more definitively evaluated.

Implications for Theory, Research, and Application

Theoretical Implications

It may be argued that the implications for theory are limited. Yet, some recent research (Holland et al., 1969) has empirically demonstrated a circular arrangement of the VPI scales from Realistic to Investigative to Artistic to Social to Enterprising to Conventional and back to Realistic. The adjacent types tend to be most highly related. Cole, Whitney, and Holland (1971) have related occupational groups to the six Holland scales. Their findings further demonstrate that the circle of Holland's scales may be considered as a continuum of interests with each scale in the circle representing a different mix of the six Holland interests. Cole and Hanson (1971) have found in addition that Holland's configuration has many commonalities with the Strong Vocational Interest Blank, the Kuder Occupational Interest Survey, the Minnesota Vocational Interest Inventory, and The American College Testing Program's Vocational Interest Profile. This sort of overlap has implications for general interest theory in that it provides a basis for comparing the different inventories and provides evidence of similarities among the instruments.

Recently Holland has developed a different quantitative method for assessing a person's resemblance to the personality types. The instrument involved, labeled the Self-Directed Search (SDS) (Holland, 1971), is also a vocational guidance device derived primarily from the correlates of the Vocational Preference Inventory. The SDS uses a broad range of content (activities, competencies, occupations, and self-ratings) to assess the person's resemblance to each personality type. Presently, the SDS is in need of empirical work (reliability and validity) in

order to determine its definitional value. However, according to Holland, it appears to be a better technique than the VPI for assessing the person's resemblance to each type.

Two other indicators of a person's resemblance to the personality types are scores on scales of the Strong Vocational Interest Blank (SVIB) and, more simply, a person's expressed vocational choice. Thus, Campbell and Holland (1972) have developed six scales from the items in the SVIB that approximate the six scales of the VPI. Of significance too is the fact that an individual's resemblance to the personality type may be effectively assessed by the uncomplicated means of self-report; a person is merely asked to express his college major or vocational choice.

Implications for Research

It would seem possible to be able to assess environments other than colleges using the EAT method. For example, communities could be assessed using government census information (Holland, 1966). Other areas of study suited to this method might be sociological or cross cultural in nature. The technique may be of use in interpreting employee-organizational interactions as well as organization outcomes such as tenure or job satisfaction (Holland, 1968). Osipow (1968) recommends that counselors be aware of the psychological characteristics of business organizations, hospitals, government agencies, and similar organizations. Such information could be valuable in counseling in the area of personnel satisfaction and performance problems. In general, Holland's theory suggests a way of controlling, interpreting, and perhaps even changing individual-environment interactions.

The personality types may be used as a helpful way to think about educational problems (Holland, 1966). For example, if an instructor of an introductory counseling psychology class knows something about the dominant orientation of the class members, this information could be used in his or her selection of teaching methods; or a teacher could be assigned to the class based on the congruence of his or her personality with the profile of the class. To take another example: if the director of a residence hall is aware of the dominant orientation of the hall members on each floor, this information could have implications for predicting the social behavior of the residents, the disciplinary problems that might arise, and even the most effective ways to "manage" the hall. As another example, consider that the dominant orientation of a group of football players is known; this information would help predict their behavior and the environment they would most likely create. Similarly, groups of student activists probably exhibit a dominant orientation, knowledge of which would aid in understanding their behavior. Even if a dominant orientation is not found for a given group, this information in itself is significant.

Holland (1966) has suggested that the types might be used to examine leadership or supervision in certain environments (business organizations, college environments,

etc.). It is reasonable to suppose, for example, that the personality patterns of the executives or administrators are related to the growth and productivity of a company or college. Information about these personality patterns could also tell us something about which individuals are most likely to survive or produce in the environment.

According to Holland (1968), to date the implications of his work have been only partially examined. Consequently, a comprehensive plan of research studies (on the personality types, the environmental models, the life histories, and people-environment relationships) would be in order. Such research would ideally use large samples (college and noncollege) of subjects of different ages from a number of diverse environments. In the area of person-environment congruency, some evidence is already available but more research is needed to determine the exact conditions under which person-environment congruency stimulates achievement, satisfaction, and personal stability.

Applied Implications

An important applied implication of the theory is the identification of institutional characteristics (using EAT). Astin has reported EAT data on 1,015 individual institutions. This information helps to describe the psychological characteristics and the curricular emphasis in the college environments so assessed. Such information would seem to be useful to administration and college personnel workers in describing the environment to parents and alumni, as well as in studying other relatively undefined or unidentified environments.

In terms of application, the area of person-environment congruency is obviously in need of additional research. As previously noted, some current findings do suggest that congruent person-environment interactions tend to be associated with stability, satisfaction, and achievement. As one example, a Conventional type interacting in a Conventional environment will probably report more vocational and personal stability, greater satisfaction, and will manifest greater achievement. Conversely, incongruent person-environment interactions seem to be associated with personal and vocational instability and dissatisfaction. Thus, knowledge of client incongruence would seem to be of value to a college counselor. Holland and others have collected a great deal of data about the attributes of people associated with each type that should be useful to counselors. If a counselor is aware of a client's personal orientation, for instance, he has a systematic way of thinking about the client and a stimulus for developing empirically informed hypotheses about this person's background, thinking, and behavior.

It would also seem that the theory would be useful in determining the nature of treatment. Because the types differ with respect to history and life style, Holland (1966) has hypothesized that they will probably respond differentially to different kinds of treatments. For example, the Realistic and Conventional types may

respond best to more directive behavioral treatments. The Social and Enterprising types (because of their major orientation toward people) would probably respond better to individual therapy and sensitivity training. The Artistic type and to a lesser extent the Investigative type would seem to be average prospects for individual therapy. Indeed, the Investigative type may even be difficult to work with because of certain intellectual resistance.

Personality types tend to vary in their sensitivity to environmental pressures. Consequently, certain types are more susceptive to change than are other types. The Social type would seem to possess the highest potential for change followed by Enterprising, Conventional, Artistic, Investigative, and Realistic types. Under this assumption, a person with an Enterprising-Conventional orientation would be considered and treated as more open to change than a person with a Realistic-Artistic orientation. Such variability in change potential among the types might be a factor in aiding the study of the impact of the college environment (particularly if a certain environment is dominated by a particular type).

Because the model environments have different kinds of built-in expectations, tasks, interpersonal relationships, and rewards for behaviors, they tend to affect personal stability in differential ways. Holland (1966) has suggested that the Realistic and Conventional environments tend to contribute to personal stability because of the concrete and explicit rewards prevalent in these environments. Conversely, the ambiguity and the intensity of involvement of individuals in the Artistic environment tend to stimulate personal instability. The Investigative, Social, and Enterprising environments lie between these poles.

In a recent work (already mentioned in the section on theoretical implications) Holland and his associates factor analyzed data based on 4-digit codes for a number of occupations (Holland et al., 1969). It was determined that the personality categories could be psychologically arranged in the following order: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. The practical implication of this finding is that a person who evidences a profile code that is deviant from the model (I-E-C-A-R-S) might exhibit an unstable career, dissatisfaction, and personal instability. Specifically, the model could be used in a counseling setting to identify inconsistent personality patterns. If a client is unable to manipulate his environment, a possible alternative counseling goal might involve helping the client to change his particular lifestyle. In order to operationalize the theory for counseling, of course, there needs to be a systematic and adequate identification and enumeration of specific behaviors associated with each type and model environment.

In general, as noted by Osipow (1968), the theory does not suggest *specific* techniques for counselors. The theory might be more suggestive of actual techniques if more about the developmental process of the personality types were known. Even this information might be insufficient, for Holland (1964) has uraged vocational counselors and personnel workers to get outside of the

interview situation. According to him, "environmental specialists" are needed to structure meaningful personal and vocational experiences. The Antioch work-study program is a good example: another example would be nursing programs complete with internships. It is thus possible that a specialist would observe and describe an individual's behavior *in relationship to* specific environmental conditions. If a field setting happens not to be available for a certain experience, a behavioral laboratory might be provided. The laboratory would give individuals the opportunity to perform specific behavioral tasks associated with a specific work environment. In any event, as Holland has maintained, students learn more about different vocations by participating in different jobs and by talking with people employed in different occupations.

The next theory on the phenomenological continuum is Stern's need x press = culture theory. This theory is based upon the work of Lewin who contends that behavior is a function of the person and the environment. In the Lewin frame of reference a need-press model was developed which Stern operationalized. Stern in his work analyzes the person and the environment in terms of personality needs and perceptions of the environment. Both needs and perceptions in this theory are inferred from self-reports.

NEED X PRESS = CULTURE THEORY

Introduction

The basic rationale for the theory under consideration in this chapter is that the organism must be studied within the context of the environment. Behavior is seen to be functionally related to the person and the environment. To measure the individual and the environment, George C. Stern (the chief proponent of this theory) operationally defined Murray's need-press model.

Stern (1923-) received his PhD in 1949 from the University of Chicago. From 1949 to 1953 he served as an Assistant Professor in the Department of Psychology at the University of Chicago. It was here that Stern worked with Benjamin Bloom and Morris Stein, two men who contributed extensively to the initial formulation and methods of the need-press theory. In 1953 Stern became an Associate Professor, Department of Psychology at Syracuse University; in 1957 he became head of the Psychological Testing Center and in 1959 a Professor of Psychology at the same university. During this period Stern worked with C. Robert Pace. Together they developed an instrument to measure what might be called the psychological characteristics of college environments (Pace & Stern, 1958). Currently Stern, still at Syracuse, is Professor of Psychology, Head of Evaluation Services of the Psychological Research Center, and the Director of the Social Psychology Training Program. His fields of interest and research include social psychology, personality assessment, and environmental influences. Stern has recently (1970) completed a book entitled *People in Context*, which is a thorough and comprehensive presentation of the need-press theory and the attendant research. This book includes all known research that has employed the indexes connected with operationalizing the important concepts of the theory (Activities Index, College Characteristics Index, High School Characteristics Index, Evening College Characteristics Index, and Organizational Climate Index).

Background and Development

The foundation of Stern's theoretical approach is based upon the work of Kurt Lewin (1936) who contended that scientific psychology must take into account the

whole situation, defined as the state of both person and environment. Lewin's classic definition of behavior was

$$B = f(P, E)$$

where B = Behavior

f = Function

P = Person

E = Environment.

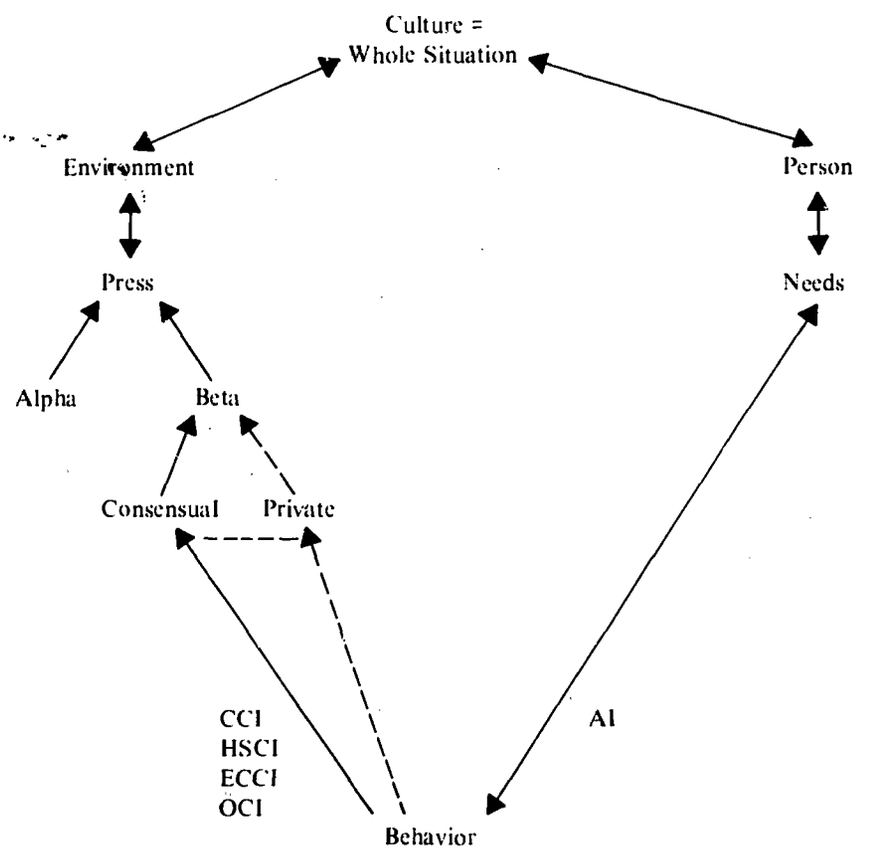
To Stern, Lewin's position suggested the necessity of developing methods of representing person and environment in commensurate terms as part of one situation. Stern argued that the only meaningful way to determine the psychological significance of the person and the environment was from behavior.

Within the Lewinian frame of reference, Murray (1938) developed a need-press model based on the assumption that behavior is an outcome of the relationship between the person and the environment. As part of this assumption, the need-press model permits the person and the environment to be represented in common conceptual terms. Much of the empirical procedures developed by Stern and Pace—as elaborately presented in *People in Context* (Stern, 1970)—grew out of operationally defining the important concepts of Murray's need-press model.

Theory

Assumptions

Three assumptions underlie the theory. The basic assumption, drawn from Lewin, is that behavior is a function of the transactional relationships between the individual and his environment. The other two assumptions are implicit in Stern's earlier writings. The first of these assumptions is that the psychological significance of the person may be inferred from behavior (see Figure 4). In Murray's need-press model the person is represented in terms of needs, as indicated by his self-reported behavior. Needs are organizational tendencies that seem to give unity and direction to a person's behavior (Stern, 1970); a need state is characterized by the tendency to perform actions of a certain kind (Murray, 1951). The spontaneous behavior manifested by individuals in their life transactions are informative about the individual's interaction processes and his goals or purposes. Needs are operationally measured by the Activities Index.



AI = Activities Index
CCI = College Characteristics Index
HSCI = High School Characteristics Index
ECCI = Evening College Characteristics Index
OCI = Organizational Climate Index

Fig. 4. The need-press model.

The second implicit assumption is that the psychological significance of the environment may be inferred from behavioral perceptions (see Figure 4). In Murray's need-press model the environment is defined in terms of press, inferred from self-reported perceptions or interpretations of the environment. The concept of press thus provides an external parallel to the internalized personality needs (Stern, 1970). Murray identified two types of press, beta and alpha. The beta press is composed of a private as well as a consensual press. The private beta press refers to the unique and private view each person has of the events in which he takes part, while the consensual beta press refers to the interpretations of events which are common, mutual, and shared by people who are participating in these events. It is the latter kind of beta press – the collectively (consensual or aggregated) perceived importance of various press – that serves as the source from which to infer the environmental situation to which individuals respond. Furthermore, this particular press is informative about the implicit objectives of a specific setting or situation.

The alpha press refers to a situational stimulus potentially capable of effecting behavioral responses, one which can be perceived and reported by a detached and knowledgeable observer. The basic difference between the beta and alpha presses seems to be that the behavioral perceptions reported by a participant in an event (the beta press) are capable of diverging from the behavioral perceptions reported by a detached observer (the alpha press). In any event, the consensual or aggregated press, once identified, includes conditions that impede needs as well as facilitate the expression of these needs. Thus, the characteristic behavior manifested by aggregates of individuals in their mutual interpersonal transactions indicates something about the press they create (Stern, 1970). The environmental press has been operationally defined by various instruments: the College Characteristics Index, the High School Characteristics Index, the Evening College Characteristics Index, and the Organizational Climate Index.

The relationship between a given psychological need and the environmental press is isomorphic, but the need-press concepts are not necessarily reciprocal. For example, the need for achievement involves the maximization of striving for success through personal effort. An environmental press for achievement is one in which opportunities for achievement behaviors are optimized. However, it may not be assumed that persons manifesting a high need for achievement will exhibit achievement-oriented responses in all situations. Nor may we assume that a strong press for achievement will stimulate achievement-oriented behavior from all people in the environment. The press is potentially capable of effecting behavior, but it need not be responded to or even perceived by a participant.

Finally, Stern (1970) describes a congruence-dissonance dimension and an anabolic-catabolic dimension. A relatively congruent person-environment relationship (a "stable" or "complimentary" combination of needs and press) may produce a sense of satisfaction or fulfillment for the participant(s). However, a relatively dissonant person-environment relationship (an "unstable" or "uncomplimentary" needs-press combination) may produce discomfort and stress

for the participant(s): this situation might stimulate a modification of the press, withdrawal of the participants, or tolerance of it. A need-press pattern of relationship that is anabolic in nature tends to stimulate self-enhancement and self-actualization. For example, a press that stimulates cognitive development is classified as anabolic (Stern, 1970). It is assumed that a need-press pattern that is primarily catabolic hinders personal development and self-actualization; restricted social environment is an example of this kind of press.

A Dual Concept: Personality Needs and Environmental Press

Murray's (1938) dual concept of needs-press describes personality trends (needs) and situational pressures (press). The 30 needs-press variables adapted from Murray by Stern are also used to describe personality trends and environment pressures. For example, the achievement variable refers to winning success through personal effort. The need for achievement may be inferred from the behavior of an individual who enjoys competitive sports, taking tests, competing for prizes, and setting high standards for himself. The press for achievement in an academic setting is reflected in high academic standards, independent study, honors programs, and extensive opportunities for out-of-class study. The 30 need-press variables adapted from Murray and in current use are listed and briefly described in Table 10.

Needs and the Activities Index (AI)

Based on Murray's classification of needs, Stern developed a needs inventory which he called the Activities Index (AI). The rationale for the development of the AI is based on the assumption that an individual's needs may be inferred either from his behavior or from his reported personal behavioral preferences. To the degree that an individual prefers a large number of activities that are associated with a particular need orientation, his or her responses in certain environments may be anticipated. The person's self-reported preferences presumably indicate something about the person's coping behavior, life goals, and personality.

The development of the Activities Index (AI) is historically related to the Interest Index (II), an inventory constructed by Stern in 1950-51. In turn, the forerunner and stimulus for this earlier instrument appeared in the 1930s as part of an 8-year study of education by the Progressive Education Association (Smith & Tyler, 1942). This study investigated personal and social adjustment, using interest inventories devised by Sheviakov and Friedberg (1940). Reported interests were believed to reflect a subject's basic aims and desires and, thus, his or her personality. Three inventories were developed which were composed of activities concerned with the study of various school subjects, extracurricular activities, and out-of-school activities. Each inventory contained 200 statements of activities commonly engaged in by young people. Although these three inventories were little used after the 8-year study, they did serve to suggest a format for a needs measure, the Interest Index (II).

TABLE 10

Scale Definitions

1. Aba Abasement—Ass Assurance: Self-depreciation and self-devaluation as reflected in the ready acknowledgment of inadequacy, ineptitude, or inferiority, the acceptance of humiliation and other forms of self-degradation versus certainty, self-confidence, or self-glorification.

2. Ach Achievement: Surmounting obstacles and attaining a successful conclusion in order to prove one's worth, striving for success through personal effort.

3. Ada Adaptability—Dfs Defensiveness: Accepting criticism, advice, or humiliation publicly versus resistance to suggestion, guidance, direction, or advice, concealment or justification of failure.

4. Aff Affiliation: Gregariousness, group-centered friendly, participatory associations with others versus social detachment, social independence, self-isolation, or unsociableness.

5. Agg Aggression—Bla Blame Avoidance: Indifference or disregard for the feelings of others as manifested in hostility, either overt or covert, direct or indirect, versus the denial or inhibition of such impulses.

6. Cha Change—Sam Sameness: Variable or flexible behavior versus repetition and routine.

7. Cnj Conjunctivity—Dsj Disjunctivity: Organized, purposeful, or planned activity patterns versus uncoordinated, disorganized, diffuse, or self-indulgent behavior.

8. Ctr Counteraction: Persistent striving to overcome difficult, frustrating, humiliating, or embarrassing experiences and failures versus avoidance or hasty withdrawal from tasks or situations that might result in such outcomes.

9. Dfr Deference—Rst Restiveness: Respect for authority, submission to the opinions and preferences of others perceived as superior versus noncompliance, insubordination, rebelliousness, resistance, or defiance.

10. Dom Dominance—Tol Tolerance: Ascendancy over others by means of assertive or manipulative control versus nonintervention, forbearance, acceptance, equalitarianism, permissiveness, humility, or meekness.

11. E A Ego Achievement (derived from Exocathection-Intraception): Self-dramatizing, idealistic social action, active or fantasied realization of dominance, power, or influence achieved through sociopolitical activities in the name of social improvement or reform.

12. Emo Emotionality—Plc Placidity: Intense, open emotional expression versus stolidness, restraint, control, or constriction.

13. Eny Energy—Pas Passivity (derived from Energy-Endurance—Psychasthenia): High activity level, intense, sustained, vigorous effort versus sluggishness or inertia.

14. Exh Exhibitionism—Inf Inferiority Avoidance: Self-display and attention-seeking versus shyness, embarrassment, self-consciousness, or withdrawal from situations in which the attention of others might be attracted.

15. F/A Fantasied Achievement (derived from Ego Ideal): Daydreams of success in achieving extraordinary public recognition, narcissistic aspirations for fame, personal distinction, or power.

16. Har Harm Avoidance—Rsk Risktaking: Fearfulness, avoidance, withdrawal, or excessive caution in situations that might result in physical pain, injury, illness, or death versus careless indifference to danger, challenging or provocative disregard for personal safety, thrill-seeking, boldness, venturesomeness, or temerity.

17. Hum Humanities, Social Science (derived from Endocathection-Extraception: Social Sciences and Humanities): The symbolic manipulation of social objects or artifacts through empirical analysis, reflection, discussion, and criticism.

18. Imp Impulsiveness—Del Deliberation: Rash, impulsive, spontaneous, or impetuous behavior versus care, caution, or reflectiveness.

19. Nar Narcissism: Self-centered, vain, egotistical, preoccupation with self, erotic feelings associated with one's own body or personality.

20. Nur Nurturance: Supporting others by providing love, assistance, or protection versus disassociation from others, indifference, withholding support, friendship, or affection.

21. Obj Objectivity—Pro Projectivity: Detached, nonmagical, unprejudiced, impersonal thinking versus autistic, irrational, paranoid, or otherwise egocentric perceptions and beliefs—superstition (Activities Index), suspicion (Environment Indexes).

[*Continued*]

TABLE 10 [*Continued*]

22. Ord Order—Dso Disorder: Compulsive organization of the immediate physical environment, manifested in a preoccupation with neatness, orderliness, arrangement, and meticulous attention to detail versus habitual disorder, confusion, disarray, or carelessness.

23. Ply Play—Wrk Work: Pleasure-seeking, sustained pursuit of amusement and entertainment versus persistently purposeful, serious, task-oriented behavior.

24. Pra Practicalness—Ipr Impracticalness (derived from Exocathection-Extraception and Pragmatism): Useful, tangibly productive, business-like applications of skill or experience in manual arts, social affairs, or commercial activities versus a speculative, theoretical, whimsical, or indifferent attitude toward practical affairs.

25. Ref Reflectiveness (derived from Endocathection-Intraception): Contemplation, Intraception, introspection, preoccupation with private psychological, spiritual, esthetic, or metaphysical experience.

26. Sci Science (derived from Endocathection-Extraception: Natural Sciences): The symbolic manipulation of physical objects through empirical analysis, reflection, discussion, and criticism.

27. Sen Sensuality—Pur Puritanism (derived from Sentience): Sensory stimulation and gratification, voluptuousness, hedonism, preoccupation with aesthetic experience versus austerity, self-denial, temperance, or abstinence, frugality, self-abnegation.

28. Sex Sexuality—Pru Prudishness (derived from Sex-Superego Conflict): Erotic heterosexual interest or activity versus the restraint, denial, or inhibition of such impulses, prudishness, asceticism, priggishness.

29. Sup Supplication—Aut Autonomy: Dependence on others for love, assistance, and protection versus detachment, independence, or self-reliance.

30. Und Understanding: Detached intellectualization, problem-solving analysis, theorizing, or abstraction as ends in themselves.

The Interest Index (II) was developed in the 1950s as part of Stern, Stein, and Bloom's (1956) construction of instruments for assessing personality. These studies (often called the Chicago studies) explored different methods of predicting

behavior from relevant personal and situational variables. The basic approach was analytical in nature, involving both an analysis of the requirements of the environment and an extensive study of the subject (using projective tests, interviews, and case conferences). Because this was an expensive and time-consuming procedure, Stern and his associates developed the so-called "II" in an attempt to reduce cost and to increase efficiency. Eight psychologists independently coded over 1,000 items describing commonplace daily activities that could be considered as evidence of need processes. These items were based largely on Murray's list of needs and those suggested by Sheviakov and Friedberg (1940). The four hundred items unanimously considered to be diagnostic of elements in the need taxonomy made up the inventory. Subjects responded to the items by reporting their personal preference, rejection, or indecision. This procedure was based on two assumptions: (1) classes of interactions associated with need constructs are reflected in specific activities, and (2) the self-report of interest in certain activities is associated with actual participation in certain interactions. Put even more simply, the II was based on the assumption that self-reported behavior is closely related to actual behavior.

In 1953, after a number of revisions, the Interest Index (II) was renamed the Activities Index (AI). In its present form, the AI is composed of 300 items, 10 items for each of the 30 need scales reported in Table 10. The method of response has been changed from "like - indifferent - dislike" to simply "like or dislike." (This two-choice format appears to yield essentially the same results.) The AI is a self-administering questionnaire requiring about 30 minutes of response time. The present version (Form 1158) has been derived from analyses of all of the preceding forms. Parallel forms have been developed in French, German, Polish, and Papago (American Indian) (Stern, 1970). A manual pertaining to administration and scoring of the AI is now being prepared by Stern. Currently only a preliminary manual is in print. The AI may be used to assess personality or to study individual or group need-press relationships.

In order to explore the possible underlying dimensions of the AI, the 30 scales were factor analyzed, using a principal components equamax solution developed by Saunders (1969). The sample used for this purpose consisted of 1,076 students (557 men and 519 women) from 23 colleges who had responded to the AI as well as the College Characteristics Index (CCI). Nearly four-fifths of the group were seniors (N = 200) and sophomores (N = 35). Two factor analyses were completed; the 30 AI scales were first factor analyzed alone and then in combination with the CCI variables. The factors extracted were about the same for both analyses. The resultant 12 personality factors (with brief descriptions) and contributing scales are shown in Table 11.

The Self-Assertion factor reflects a need to achieve personal power and sociopolitical recognition. People with high scores tend to like political action, controlling people, and group attention.

TABLE 11

First-Order Student Personality Factors (AI)

Factor title	Contributing scales (see Table 1)
1. Self-Assertion	Ego Achievement, Dominance, Exhibitionism, Fantasied Achievement
2. Audacity-Timidity	Risk-taking, Fantasied Achievement, Aggression, Science
3. Intellectual Interests	Reflectiveness, Humanities-Social Sciences, Understanding, Science
4. Motivation	Achievement, Counteraction, Understanding, Energy
5. Applied Interests	Practicalness, Science, Order
6. Orderliness	Conjunctivity, Sameness, Order, Deliberation
7. Submissiveness	Adaptability, Abasement, Nurturance, Deference
8. Closeness	Supplication, Sexuality, Nurturance, Deference
9. Sensuousness	Sensuality, Narcissism, Sexuality
10. Friendliness	Affiliation, Play
11. Expressiveness-Constraint	Emotionality, Impulsiveness, Exhibitionism, Sexuality
12. Egoism-Diffidence	Narcissism, Fantasied Achievement, Projectivity

Source: G. G. Stern, Student ecology and the college environment. *The Journal of Medical Education.* Volume 40, 1965. Copyright 1965 by the Association of American Medical Colleges, and reproduced by permission.

The Audacity-Timidity factor emphasizes ability and aggressiveness in physical activities and in interpersonal relationships. Indifference to danger and interest in science are also related to this factor.

The Intellectual Interests factor "taps" an individual's need for intellectual activities. High scorers tend to have intellectual interests in the arts and sciences that are empirical as well as abstract.

The Motivation factor focuses on competitiveness, perseverance, and intellectual

aspiration. High scores suggest an achievement-oriented person who is persistent and enjoys hard work and competition.

The most important features of the Applied Interests factor are diligence and utility. Individuals scoring high on this factor attempt to achieve success by means of concrete, socially acceptable activities.

The Orderliness factor is concerned with personal organization and deliberation. People scoring high on this factor tend to be self-controlled and planful; they guard against the expression of impulses.

The Submissiveness factor represents social conformity and other-directedness. High scorers tend to be humble, helpful, compliant people.

On the Closeness factor high scores indicate a need for warmth and emotional support. People scoring high on this factor seek close interpersonal relationships.

On the Sensuousness factor high scores indicate a need for sensory and esthetic experience as well as self-indulgence.

The Friendliness factor focuses on social behavior and social life. High scorers enjoy friendly, playful relationships with other people primarily in a group setting.

The Expressiveness-Constraint factor purports to assess freedom from self-imposed controls. Individuals scoring high on this factor tend to be outgoing, spontaneous, and uninhibited.

Individuals scoring high on the Egoism-Diffidence factor tend to be self-centered. They have daydreams of extraordinary public recognition and achievement. In addition, these people are very much concerned about their own personal appearance and comfort.

As part of his analysis, Saunders (1969) used analysis of variance on computed factor scores for 1,076 students to determine if each personality factor had the power to discriminate between the 23 college student bodies. The results showed that all 12 factors did differentiate the student bodies. (The test for the main effect was found to be significant, $p < .01$, for each factor.) The set of findings certainly suggests that the obtained AI personality factors are able to differentiate effectively among student bodies.

In a second-order factor analysis, the 12 AI first-order factors were found to be underlayed by four second-order significant dimensions: Achievement Orientation, [illegible]endency Needs, Emotional Expression, and Educability. The Educability [illegible]or, however, overlaps with two of the factors (Achievement Orientation and

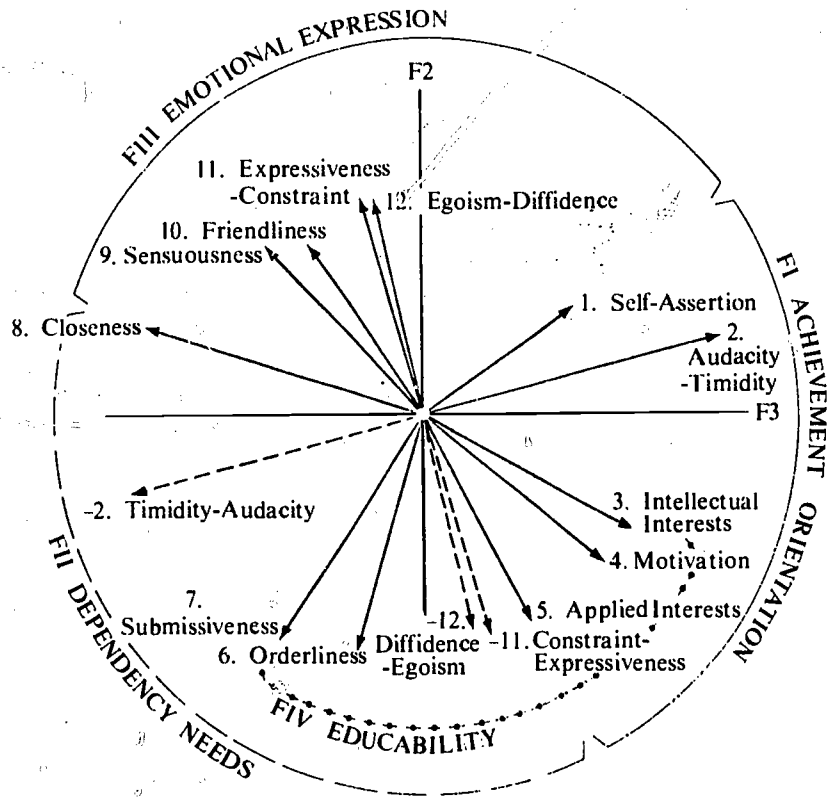
TABLE 12

Second-Order Student Personality Factors (AI)

Factor title	Contributing factors
I. Achievement Orientation	1. Self-Assertion 2. Audacity-Timidity 3. Intellectual Interests 4. Motivation 5. Applied Interests
II. Dependency Needs	5. Applied Interests -11. Constraint-Expressiveness -12. Diffidence-Egoism 6. Orderliness 7. Submissiveness -2. Timidity-Audacity 8. Closeness
III. Emotional Expression	8. Closeness 9. Sensuousness 10. Friendliness 11. Expressiveness-Constraint 12. Egoism-Diffidence 1. Self-Assertion
IV. Educability	3. Intellectual Interests 4. Motivation 5. Applied Interests 6. Orderliness 7. Submissiveness

- = negative loading

Dependency Needs). A total of eight factors were actually extracted in the analysis, but most of the common variance was accounted for in the first three factors of the four listed above. These four second-order factors and the 12 contributing first-order factors are given in Table 12.



Source: G. G. Stern, *People in context*. New York: Wiley, 1970. Copyright 1970 by John Wiley and Sons, and reproduced by permission.

Fig. 5. Relationships between the unrotated (F2, F3) factor fan and the rotated (FI-FIV) second-order student personality factors.

The 12 student personality factors in Table 11 are said to be related to one another in a continuous circular order (see Figure 5), with the three second-order factors defining the circle. In general, the closer two factors are to one another in sequence, the higher the presumed relationship between them.

The Achievement Orientation dimension consists of five factors (as shown in Table 12 or Figure 5). A high pattern in this area suggests strong ego strivings, more specifically defined by the factors and scales involved; low scores in this area indicate indifference to personal achievement. The Dependency Needs dimension is composed of seven factors. High scores in this area indicate a high level of dependent, submissive, socially controlled behavior; low scores suggest a need for autonomy, ascendance, and nonconformity. The third dimension (Emotional Expression), which brings the circle to a close, is based on six factors. High scores in this area suggest a need for social participation and emotional spontaneity. The fourth (and partially overlapping) dimension (Educability) consists of five factors. This dimension seems to be concerned with academic achievement. Individuals scoring high in this area tend to accept direction; however, they will probably not be original or creative.

In sum, the basic idea behind the AI is that an individual's needs may be inferred from his behavior (self-reported preferences). Knowledge about an individual's preferences is considered as informative about his responses in certain environments. In its existing form, the [redacted] composed of 300 items, 10 items for each of the 30 need scales. The index may be used to assess personality or to explore individual or group need-press relationships when used with an environmental index. A factor analysis of the 30 scales has yielded 12 underlying personality dimensions. In a second-order factor analysis, four dimensions (Achievement Orientation, Dependency Needs, Emotional Expression, and Educability) have been extracted. Three of these four factors define a circumplex fan composed of the 12 first-order factors.

Validity of the AI

A number of studies have been conducted pertaining to the validity of the AI. Stern, Pace, and others, in conducting these studies of concurrent and predictive validity, have used a variety of empirical approaches. One approach has primarily focused on the relationship between personal needs as measured by the AI and other tests and inventories. For example, findings show that the AI, the Interpersonal Behavior Inventory, and the Interpersonal Checklist all seem to have a basic underlying structure (Lorr & McNair, 1965; Lorr & McNair, 1963; Stern, 1970). Common elements are present in the circumplex fans for these three instruments. In one study (Lane, 1953) items from the Strong Vocational Interest Blank were coded by needs categories. The keys for lawyer, minister, and teacher were then converted into needs patterns. These needs patterns were found to be related to the AI patterns in expected ways for samples of individuals in the same profession. Stern (1962b)

studied the relationships between all AI and CCI scores for the 1,076 students from 23 colleges and found little relationship between the two instruments (average r = .08). Similarly, McFee (1961) found the correlation between needs-scale scores and press-scale scores for students from the same institution to be low. The findings of these two studies suggest that a student's description of the environment is not a function of his or her self-description. However, Herr and Moore (1968) found that college students' (freshmen) expectations of the environment reported on the CCI are related to their needs in some areas.

In a factor analytic study of the AI and the CCI, Saunders (1969) reported that the factors derived from these two instruments are independent of each other. This evidence indicates that the AI is primarily a measure of the individual reporting about himself or herself and that the CCI is mainly a measure of college environment independent of the personality of the respondent. Stricker (1967), in adding to the known validity data, intercorrelated the second-order factor scores of the AI and the CCI. He found that the four second-order AI factor scores (Intellectual Orientation, Dependency Needs, Emotional Expression, and Educability) were indeed significantly related to each CCI second-order factor score (Intellectual Climate and Nonintellectual Climate), although the magnitude of these correlations (.12 to .27) was low. Because the four AI factors were only intercorrelated to a small extent, the factors thus seem to share few common variances. This particular result suggests that the scores may be used as relatively independent measures. However, the two CCI factors were found to intercorrelate .53, thus making their independence questionable.

The evidence thus far seems to indicate that the AI is a reasonably valid measure of the individual's reporting about his own needs as manifested by his behavioral preferences. The AI factors (first- and second-order) are independent, suggesting that the scores may be used as relatively independent measures. The results of certain studies do indicate that the scores on the scales of the AI have elements in common with scores on scales of other inventories measuring similar constructs.

A second approach used in determining validity has been to collect AI data on a wide range of educational and vocational groups. Many of these studies have a trait-factor orientation, and simply attempt to identify commonalities and/or differences between two or more groups. The results of some of these concurrent validity studies have identified differences between various vocational groups. Funkenstein (1960) and Wolarsky, King, and Funkenstein (1964)—as reported in Stern (1970)—studied beginning medical school students at Harvard. They found that medical school students oriented toward service were more outgoing than research-oriented students, but less aggressive and nonconforming than students who were psychiatrically oriented. Students oriented toward surgery seemed to be more conforming, achievement-oriented, and orderly than those choosing psychiatry. Stern and Scanlon (1958) explored differences between faculty, practitioners, and students in five medical specialities. They found little variance among the faculty regardless of field. Other studies have found differences in

personality patterns of teachers (Donoian, 1965; Gillis, 1964; Klohr et al., 1959; Merwin & Di Vesta, 1959); counselors (Mueller, 1962b); nurses (Moore, White & Willman, 1961); academic major groups (Tatham, Stellwagen, & Stern, 1957); athletes (Naugle, Stern, & Eschenfelder, 1956); and students in different types of colleges (Butler, 1969; Campbell, 1964; Rowe, 1966) when compared to college students in general. Group differences on the AI have also been reported for men and women (Stone, 1963); honors students (Capretta et al., 1963); independent study students (Froe, 1962); and college student dropouts (Rowe, 1963) when compared to college students in general. Di Vesta and Cox (1960) have studied the relationship between AI scores and conformity behavior. A few other studies (Donovan et al., 1957; Stern, 1960, 1962a; Stern & Cope, 1956; Stern, Stein, & Bloom, 1956) have investigated the relationships between the AI and authoritarianism and an authoritarianism scoring key was developed. In general, the findings of the above studies and the results of additional unpublished studies cited by Stern (1970) provide evidence that the AI describes groups in ways consistent with existing knowledge. The AI seems to be sensitive enough to identify differences that are consistent with existing expectations.

A third set of validity studies has explored the relationships of AI scores with various external criteria. In some of these studies (Crist, 1960; Louvenstein, Pepinsky, & Peters, 1959; Stern, 1954; Stern, Stein, & Bloom, 1956; Stone & Foster, 1964; Webb, 1967) AI scores were found to be related to academic achievement and obtained grade-point average. Two other studies reported by Stern (1970) investigated teacher characteristics and classroom effectiveness: Masling and Stern (1966) found high teacher achievement needs to be associated with student performance on achievement tests; and Myers (1963), reversing the design, found a relationship between student needs and teacher performance. Brodkey et al. (1959) and Vacchiano and Adrian (1966) were able to predict academic choice or career based on personality need constructs as measured by the AI. Mueller (1963) attempted to predict counselor need structures from their interview behavior, but concluded that it is difficult to infer counselor needs from interview behavior. Peters and Correll (1959) made predictions of conflict within small youth groups (3 to 5 members) living abroad for 6 months using AI scores. This prediction was confirmed for the groups for the first year of the study but was not for the second year.

The studies cited under this third approach to validity have all attempted to specify in advance (or predict) the behavioral consequences associated with AI scores. In general, these concurrent and predictive validity studies have shown AI scores to be associated in expected ways with academic achievement, obtained grade-point average, classroom effectiveness (student), teacher effectiveness, academic or career choice, and interpersonal interactions. The findings of these studies thus serve as further support for the validity of the AI.

Three studies have focused on the relationship between AI scale scores and self-ratings on variables which the scales purport to measure. Scanlon (1959), attempting to determine if students exhibit behavior consistent with the AI profile summary, had freshmen rank their peers in terms of AI categories (with respect to the behavior they exhibited on the campus in everyday life). Most of the specific findings supported the congruency hypothesis in the direction of the results but statistically the results were not conclusive. Mueller (1962a), in a follow-up study of his earlier attempt to predict counselor AI responses from interview behavior, found that insightful subjects were the easiest predictees. Insight was defined by the relationship between the subject's AI scores and his estimates of these scores. The last study in this area (Jackson, Messick, & Solley, 1957) explored the application of a multidimensional scaling approach to the perception of personality. Subjects' judgments about personality similarities were analyzed by using multidimensional scaling techniques. Four dimensions were extracted, three of which accounted for a major part of the explained variance. These dimensions were interpreted as theoretical-intellectual, friendship, and age-status by their partial correspondence with AI data, friendship ratings, IQ scores, and age. In general, the rather limited research in this area does suggest that people tend to describe themselves in ways consistent with their scores on the AI scales.

In summary, the concurrent and predictive validity studies that have been cited lend support to the meanings attributed to the AI scales. The relevant findings indicate that the AI scale scores are associated with scales measuring similar constructs, are able to discriminate between groups, are related to external criteria, and (in the few attempted instances) are related to student self-ratings.

Reliability of the AI

Data indicate that the AI is characterized by high-scale reliability (Stern, 1970). The scale reliabilities have been estimated by means of Kuder-Richardson formulas 20 and 21 for two different samples. Kuder-Richardson 20-scale reliabilities were computed for the previously discussed norm group of 1,076 students from 23 colleges and ranged from .51 to .88. Kuder-Richardson 20- and 21-scale reliabilities were also computed for a sample of 4,021 students drawn from 36 programs in 34 institutions. The KR-20 coefficients ranged from .53 to .88 while the KR-21 coefficients ranged from .25 to .85. The KR-20 values are close to the maximum possible for the short 10-item scales on the AI. Test-retest estimates of reliability have also been computed for 122 schoolteachers retested after 1 week, 2 weeks, 1 month, 2 months, and 1 year. In general, there is little difference between any of the reliabilities found during the periods encompassed from 1 to 8 weeks. However, the 1-year reliabilities were lower. Finally, the internal consistency of each scale was high, indicating that the scales are homogeneous. When the items of a given scale are thus statistically homogeneous, it may be safely assumed that the items are measuring the same process (Stern, 1970).

Summary

In Murray's need-press model the person is defined in terms of needs inferred from his behavior. To measure an individual's needs Stern has developed the Activities Index. The basic assumption behind the Index is that needs are reflected in behavior, which in turn may be inferred from an individual's self-reported interest in specific activities. Although the relationship between self-reported behavior and actual behavior is obviously far from perfect, it is assumed to be close enough for reported behavior to serve as a meaningful estimate of actual behavior. If an individual reports preferences for a number of activities associated with a given need construct, his or her particular response patterns and interaction processes in certain environments may be reasonably inferred. From a number of studies that have explored the validity of the AI, support has been lent to the meaning attributed to the AI scales as well as to the rationale underlying the development of the Index itself. Reliability data (Kuder-Richardson and test-retest) indicate that each scale is a dependable measure of a particular process.

Press and Environmental Indexes

College Characteristics Index In order to measure the environmental press in the need-press framework, Pace and Stern initially developed the College Characteristics Index (CCI). They maintained that if students differ on certain variables, it is probably realistic to think that college environments also differ. Thus, it was assumed that behavior may be predicted more effectively using both the individual and the environment. Operationally, Pace and Stern (1958) defined press as the characteristic demands or features of the environment—as perceived by those who live in the particular environment. The basic rationale behind the development of the CCI is that the press may be inferred from the consensual or aggregated behavioral perceptions or interpretations about the environment.

If a consensus of people endorse activities and events associated with a particular press on the CCI, a particular environmental situation—potentially capable of shaping a certain pattern of responses—may be expected. The endorsement of certain activities and events when aggregated across individuals is informative about the press created or tolerated by the individuals in the environment. In sum, for each personality need there is a corresponding environmental press. Both needs and press are inferred from either behavior or self-reported activities and events.

The initial environmental index that was developed was (and still is) called the College Characteristics Index (CCI). The CCI is a measure of 30 kinds of press, each paralleling the analogous need scale of the AI. The AI was the forerunner of the CCI, in that the 30 need variables were restructured in terms of "presses" applicable to a college environment. Items were developed for each scale in accordance with the academic, administrative, and student elements of the college

environment. The content of the items is composed of the description of activities, policies, procedures, attitudes, and impressions that may characterize different types of college environments.

In 1957 the first draft of the CCI was administered to 423 students and 71 faculty members in five different university environments. The CCI consisted of 300 items organized into 30 scales each containing 10 items; each of these scales is presumed to be environmental-press counterparts of the 30 personality needs measured by the AI. (The findings of this exploratory study are reported in Pace and Stern, 1958.) After an item analysis and a restructuring of the instrument, the newly revised CCI was completed by students in 22 colleges. Analysis of the obtained data led to a third version of the CCI (Form 1158), the version that has been administered to over 100,000 students at hundreds of colleges and universities.

The present form of the CCI (1158) still contains 300 items about the specific environment, and is still organized into 30 scales (see Table 13), each of which has 10 items. Each of the items is to be answered true or false. The CCI is a self-administering questionnaire requiring about 15 minutes of response time. A manual pertaining to the administration and scoring of the Environmental Indexes (College Characteristics Index, High School Characteristics Index, Evening College Characteristics Index, and Organizational Climate Index) is being prepared by Stern. Presently only a preliminary manual is in print. One use of the CCI is for institutional self-analysis in order, for example, to explore the consistency between the stated purposes of an institution (explicit press) and the perceived policies and practices as reported by faculty and students (implicit press). The CCI may also be used in conjunction with the AI to study individual or group need-press relationships.

Saunders (1969) has examined the factorial structure of the CCI separately and in combination with the AI variables. These analyses were based on the same sample used in the AI factorial analyses, and procedures identical to those described earlier were followed. The evidence from this study indicates that 11 common factors are present in the CCI, as listed in Table 13. Saunders computed factor scores, and used analysis of variance to determine if the environmental factors could successfully discriminate among the 23 colleges. All 11 factors did differentiate among the college environments. The following are brief descriptions of the environmental factors.

The Aspiration Level factor reflects an environmental press for intellectual and professional achievement. A high score indicates students' awareness of their being expected (and being able) to perform at a high level. As part of such an environment, there is an emphasis on preparing for graduate work.

TABLE 13

First-Order College Environment Factors (CCI)

Factor title	Contributing scales (see Table 1)
1. Aspiration Level	Counteraction, Change, Fantasied Achievement, Understanding
2. Intellectual Climate	Reflectiveness, Humanities-Social Sciences, Sensuality, Understanding, Fantasied Achievement
3. Student Dignity	Objectivity, Assurance, Tolerance
4. Academic Climate	Humanities-Social Sciences, Science
5. Academic Achievement	Achievement, Energy, Understanding, Counteraction, Conjunctivity
6. Self-Expression	Ego Achievement, Emotionality, Exhibitionism, Energy
7. Group Life	Affiliation, Supplication, Nurturance, Adaptiveness
8. Academic Organization	Blame Avoidance, Order, Conjunctivity, Deliberation, Deference, Narcissism
9. Social Form	Narcissism, Nurturance, Adaptiveness, Dominance, Play
10. Play	Sexuality, Risk-taking, Play, Impulsiveness
11. Vocational Climate	Practicalness, Puritanism, Deference, Order, Adaptiveness

Source: G. G. Stern, Student ecology and the college environment. *The Journal of Medical Education,* Volume 40, 1965. Copyright 1965 by the Association of American Medical Colleges, and reproduced by permission.

The Intellectual Climate factor stresses an environment devoted to scholarly activities in the humanities, arts, and social sciences. There is an emphasis on pure scholarship and basic research, as well as an interest in poetry, music, painting, architecture, and the like.

The Student Dignity factor reflects an environmental emphasis on student self-determination and personal responsibility. A high score on this factor suggests that the environmental climate is nonauthoritarian. In general, students tend to be treated with respect and consideration.

A high score on the Academic Climate factor suggests an environmental concern for academic excellence in the traditional areas of humanities, social sciences, and natural sciences. Environments scoring high on this factor tend to have outstanding course offerings as well as well-equipped libraries and laboratories.

The Academic Achievement factor emphasizes high standards of achievement. Students are encouraged to take part in honors programs, tutorials, special courses, independent study, etc. The competition for grades is intense.

The Self-Expression factor focuses on environmental opportunities for the development of leadership potential and self-assurance. Students are encouraged to participate in public discussion, debates, student drama, etc.

A high score on the Group Life factor suggests an environment with numerous opportunities for group activity. In general, the environment reflects a concern for the welfare of fellow students, including the less fortunate members of the community.

A high score on the Academic Organization factor indicates an environmental press for organization and structure in the academic environment. Activities in such an environment tend to be purposeful and planned. Students tend not to resist authority.

The Social Form factor partially overlaps with the Group Life factor. The environmental emphasis is on the development of social skills. There is a general student awareness of social position and role.

The Play-Work factor suggests that social life is a dominant press in the environment. The environment exhibits many opportunities for parties, dancing, drinking, and informal dating. Students frequently participate in demonstrations.

The Vocational Climate factor emphasizes practical activities. The environment evidences a press for orderliness and conformity in student-faculty relationships. The opportunities for aesthetic experiences are limited.

In a second-order factor analysis of the 11 CCI factors, 8 factors have been extracted (see Table 14). Three of these dimensions (Intellectual Climate, Nonintellectual Climate, and Impulse Control) are significant second-order factors; however, the first two account for most of the common variance.

Unlike the AI factors the 11 college environment factors are not related to one another in a circular order. As shown in Figure 6, the second-order dimensions attach at only one end.

TABLE 14

Second-Order College Environment Factors (CCI)

Factor title	Contributing factors
I. Intellectual Climate	10. Work-Play
	11. Nonvocational Climate
	1. Aspiration Level
	2. Intellectual Climate
	3. Student Dignity
	4. Academic Climate
	5. Academic Achievement
	6. Self-Expression
II. Nonintellectual Climate	6. Self-Expression
	7. Group Life
	8. Academic Organization
	9. Social Form
	10. Play-Work
	11. Vocational Climate
III. Impulse Control	10. Work-Play
	8. Academic Organization

– = negative loading

The Intellectual Climate dimension which is composed of eight first-order factors seems to be the counterpart of the Achievement Orientation dimension of the AI. A high pattern on the Intellectual Climate factor indicates an environment with high standards of achievement, opportunities to develop self-assurance, noncustodial

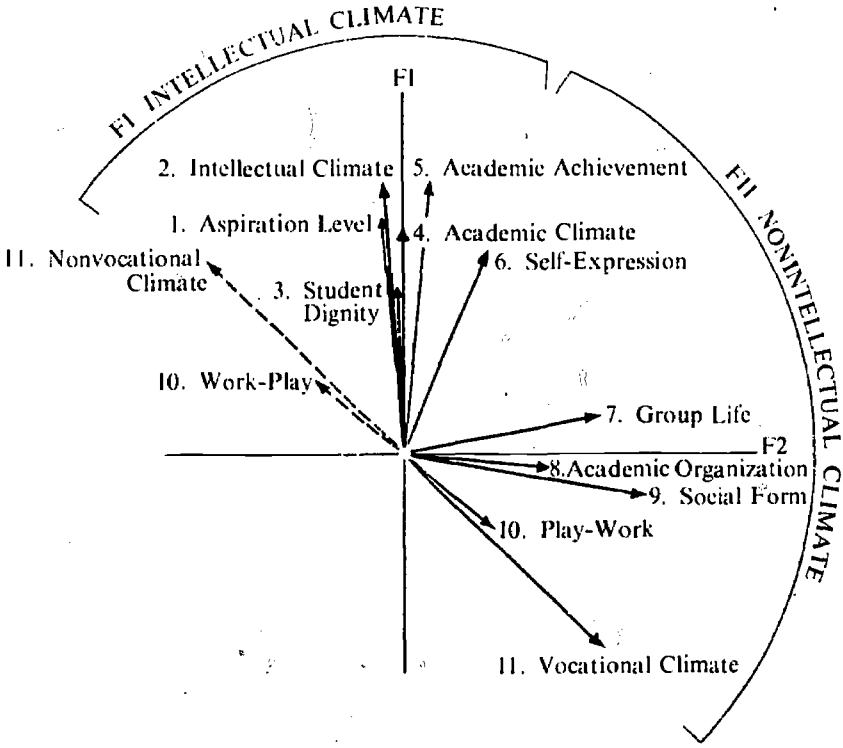


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Fig. 6. Relationships between the unrotated (F1, F2) factor fan and the rotated (FI-FIV) second-order college environment factors.

student personnel practices, absence of vocationalism, and quality academic staff and facilities. The Nonintellectual Climate dimension is composed of six factors and appears to correspond to the Dependency Need dimension and the Emotional Expression dimension of the AI. High scores in this area suggest that student academic and social affairs are formally organized. In general, the environment tends to be supportive in nature which suggests a degree of institutional control. The third dimension, Impulse Control, is based on the two factors of emotional constriction and institutional control.

In summary, the basic assumption underlying the CCI is that press may be inferred from behavioral perceptions about the environment. Knowledge about the environmental perceptions presents some information about the press created by the behavior of the people in the environment. In its current form, the CCI consists of 300 items, 10 items for each of 30 press scales. The CCI may be used for institutional self-analysis and to study individual or group need-press relationships when used in conjunction with the AI. A factor analysis has shown that 11 common factors are present in the CCI. A second-order factor analysis has yielded three factors (Intellectual Climate, Nonintellectual Climate, and Impulse Control).

Validity of the CCI. Numerous investigations have been made that have implications for the validity of the CCI. Some of these studies have focused on the relationship between CCI scale or factor scores, on the one hand, and the scale scores of various inventories measuring similar constructs, on the other hand. Another group of studies have used CCI scale scores to differentiate between college environments and the perceptions of different groups. Finally, certain studies have presented the relationships between CCI scale scores or CCI descriptions and present or future external criteria.

The few studies relating the environmental press (as measured by the CCI) to other inventories tend to support the validity of the CCI. The factor structures of the CCI, of the Organizatonal Climate Index, and of the High School Characteristics Index show a great deal of similarity to each other, thus indicating that there may be some common structure underlying these three indexes (Stern, 1970). Astin and Holland (1961) have related the Environmental Assessment Technique (EAT) measure with the CCI scales and found significant correlations between matching scales (across 36 colleges). For example, in their study, the EAT Artistic measure correlates .69 with the CCI Sensuality scale; the Enterprising measure correlates .79 with the Humanities, Social Science scale, etc. (The full table of correlations has been displayed on p. 76 of Chapter 4.) Using second-order factor scores, Stern (1963) has found that the Intellectual Climate scores on the CCI correlate highly with other measures of academic quality: for example, the Intellectual Climate scores correlate .83 with the Scholastic Aptitude Test Verbal score means, .34 with the Scholastic Aptitude Test Mathematical score means, and .71 with the National Merit Scholarship Qualifying Test means. Stern (1962b) and McFee (1961), studying the relationships between the AI and CCI scales, found the correlations to be low; these results indicated that the student's report of the environment is not

significantly related to his/her self-description. However, it should be noted that Herr and Moore (1968) found that freshman students tend to expect college to correspond to their needs in certain areas (such as rewarding personal growth and expanding horizons). In a study by Becker, Goodstein, and Mittman (1965) the relationship between the Minnesota Multiphasic Personality Inventory (MMPI) and the CCI was explored; among 319 undergraduates of both sexes, scores on the CCI were unrelated to scores on the MMPI. These results are consistent with those of Stern (1962b) and McFee (1961), suggesting that environmental press is independent of personality needs.

Saunders (1969) has factor analyzed the scales of the AI and the CCI, and has found the derived factors of the two indexes to be relatively independent of each other. From this evidence, the CCI indeed seems to be primarily a measure of college environment, one which is independent of the personality of the particular respondents. Stricker (1967), in intercorrelating the two second-order factor scores of the CCI, found a relationship of .53 however. He suggests that this finding makes it difficult to interpret either factor as a meaningful description of the climate within a single institution. Given the contradictory results of these two studies, factor independence is open to question.

In general, the few studies that have been cited lend support to the validity of the CCI. The CCI factors (first- and second-order) tend to be relatively independent of the AI factors suggesting that the CCI is primarily a measure of the environment independent of personality. (However, at least one study has found the CCI second-order factors to be related to one another, which raises some question about their independence.) Other research, the results of which support the validity of the CCI, suggests that the CCI scales are related to (and have a factor structure in common with) other inventories measuring environmental constructs.

Studies exploring the usefulness of the CCI in differentiating among college environments and among various group perceptions of the environment have been more numerous. In the area of college class differences, three studies (Bragg, 1967; Johnson & Kurpius, 1967; Rowe, 1962) have found that freshmen press profiles differ from junior or senior press profiles (mainly on the intellectual climate variable). Pace and Stern (1958) found that the press profiles obtained from students, faculty, and administrators are highly consistent within one institution. In one study (Ivey, Miller, & Goldstein, 1967) students, dormitory head residents, and student personnel workers were found to vary in their perceptions of the college environment; the greatest differences occurred between head residents and students. Other studies (Barger & Hall, 1967; Greene, 1966) have used the CCI not only for institutional self-analysis but also to describe the psychological environment of a university. In addition, the CCI has been used in a number of studies to differentiate among the environmental press of colleges (Butler, 1969; Campbell, 1964; Cole & Fields, 1961; Gottheil, 1969; Hassenger & Weiss, 1966; King, 1969; Pace & Stern, 1958; Rowe, 1966; Weiss, 1967), the programs within a complex institution (Stern, 1960), and the types of residence (Baker, 1966).

Four studies using the CCI have focused on group differences. Baker (1966a) found honors students to differ from other freshmen on 6 of the 13 CCI factors. Standing and Parker (1964) reported that students who persist in college tend to characterize the university as having a more intellectual climate than those who drop out. However, Thistlethwaite (1959a, 1959b) in two separate studies found that the press profiles of National Merit Scholars and Finalists did not differ from profiles obtained from more representative cross sections of students at the same institutions.

Another group of studies has shown that the CCI may be used to measure preconceptions or expectations of college environmental press among high school students and entering college freshmen. Findings (Stern, 1961) showed that the expected press obtained from incoming freshmen at the same college are highly consistent, regardless of the high school background of these students. In general, the results of most of the other research in this area suggest that freshmen tend to expect intellectual and social activities at unrealistically high levels as compared with the environmental perceptions of upperclassmen (Pervin, 1967b; Seymour, 1968; Standing & Parker, 1964; Stern, 1961, 1967). The evidence indicates that incoming freshmen tend to expect something quite different from what the upperclassmen report they have actually experienced in the college environment.

In summary, this group of studies—as well as other unpublished manuscripts cited in Stern (1970)—lends additional support to the concurrent validity of the CCI. Existing findings showed that the CCI is able to differentiate among college environments. Moreover, the differences so identified are relatively consistent with the distinctions cited by qualified observers. Research results further indicate that the results of the CCI when used within an institution do discriminate among academic programs, type of residence, and various groups. Finally, evidence supports the use of the CCI to assess the expectations of the college environmental press among entering students, even though they may be partially incorrect.

Most of the validity studies which have explored the relationship of CCI scores with other criteria have focused on academic achievement. In one of these studies Stern (1963) determined that the Intellectual Climate scores of the CCI correlated .80 with the Kapp-Greenbaum Index of scholarly awards per 1,000 graduates, .76 with the PhD output rate (1936-1956), .49 with the percentage of National Merit Scholarship finalists, and .59 with the number of Merit Scholars per 1,000 (1960). These data certainly indicate that the Intellectual Climate of an environment is related to the quality of its student body and to their academic achievements after graduation. Two other studies show a relationship between CCI scores and academic achievement: Lauterbach and Vielhaber (1966) found that the closer a student's expectation profile was to the freshman press profile, the higher the student's academic achievement tended to be; and Wood (1964), defining achievement as the difference between attained and predicted college grade averages, found partial support for a relationship between perception of the environment and achievement. Thistlethwaite (1959a, 1959b, 1960), in a series of

studies, has shown the influence of the academic environment (as measured by the CCI) on student motivation and achievement. He used the CCI items to discriminate between students reporting positive changes in their level of aspiration for seeking advanced degrees and those reporting negative changes. Finally, Eberly and Cech (1968) have explored the impact of a summer experimental residence hall program on the academic performance and perceptions of lower quarter high school graduates. They found that the experimental treatment was not associated with academic performance; however, students living in the experimental hall did leave the summer session with a more favorable impression of the university.

In summary, pertinent studies lend a certain degree of support to the concurrent and predictive (in a few instances) validity of the CCI. The scales of the CCI seem to be meaningful and useful in the assessment of college environments. Evidence indicates that the CCI is primarily a measure of college environment that is independent of the personality of the respondent (except when entering student expectations are measured). Research findings generally indicate that the CCI scale scores are related to scales measuring similar constructs, are able to differentiate among different environments and the perceptions of different groups in a given environment, and are related in meaningful ways to other criteria.

Reliability of the CCI. As have the AI, the scale reliabilities for the CCI have been estimated by means of Kuder-Richardson formulas 20 and 21 for two different samples. The Kuder-Richardson 20-scale reliabilities have been computed on a CCI norm group of 1,993 cases from 32 colleges. These coefficients range from .34 to .81. In addition, Kuder-Richardson 20 and 21 reliabilities have been computed for a sample of 4,196 cases from 59 programs in 51 colleges. The KR-20 coefficients range from .40 to .78 while the KR-21 coefficients range from .22 to .72. In general, the coefficients are acceptable, but not especially high.

CCI scale reliabilities have also been computed for 100 cases retested after 1 month. Again, the coefficients of stability are acceptable, but not as high as might be expected (Stern, 1970). In this regard, Stern suggests that reliability might be more effectively measured using different samples of people rather than by retesting the same group. Finally, high internal consistency of each scale indicates that the scales are homogeneous.

Summary. In Murray's need-press model the environment is defined in terms of press inferred from behavior. To assess college environmental press the CCI was developed as a counterpart to the AI. The basic rationale of the CCI is that environmental press is indicated by the consensual or aggregated behavioral perceptions which may be inferred from individuals' self-reports about specific activities. Thus, the environment is defined as it is collectively perceived and reported. Endorsement of a number of activities on the CCI associated with a particular press suggests that an environment is potentially capable of shaping a

certain pattern of responses. The validity studies that have been conducted using the CCI tend to be supportive in nature. Other data indicate that the scale reliabilities of the CCI are at least adequate.

High School Characteristics Index. The High School Characteristics Index (HSCI) (Form 960) was developed to measure the environmental press of educational settings different from colleges and universities. As with the CCI, the basic assumption underlying the HSCI is that the environment can be appropriately defined in terms of the press inferred from the aggregated behavioral perceptions of its inhabitants.

The HSCI is a measure of 30 kinds of press, again parallel to the need scales of the AI. The Index (Form 960) contains 300 items about the environment, grouped into 30 scales (see Table 10) of 10 items each, to be answered true or false. The index is a self-administering questionnaire requiring about 15 minutes of response time. At present, the HSCI Form 960 is recommended only for purposes of exploratory research (Stern, 1970).

The factor structure of the HSCI has been explored using 947 students from 12 schools (Stern, 1970). Using the equamax procedure, seven factors have been extracted from the HSCI scale matrix (see Table 15). These factors account for about 59% of the common variance. The following are descriptions of the factors.

The Intellectual Climate factor accounts for all of the scales loading on CCI Intellectual and Academic Climate factors. This factor stresses an environment idealistically devoted to scholarship, research, and, in general, academic excellence.

The Expressiveness factor suggests an environment possessing opportunities for people to be flexible, aesthetically aware, and emotionally involved with other people. A press exists for people to be active and to some extent dependent on each other.

The Group Life factor indicates an environment with opportunities for having fun, for being friendly and actively outgoing. The press further suggests that the students tend to be gregarious and group-centered.

The Personal Dignity factor suggests an environment that encourages autonomy, but also permits the expression of dependency and defensiveness.

The Achievement Standards factor implies an environment that is concerned with self organization, persistent striving, and problem solving. Achievement strivings seem to be associated at this age with a concern about appearance and dress.

TABLE 15

First-Order High School Environment Factors (HSCI)

Factor title	Contributing scales
1. Intellectual Climate	Humanities-Social Sciences, Fantasied Achievement, Reflectiveness, Ego Achievement, Science, Nurturance, Understanding, Sensuality
2. Expressiveness	Change, Emotionality, Energy, Sensuality, Understanding, Supplication
3. Group Life	Play, Affiliation, Exhibitionism, Emotionality, Nurturance
4. Personal Dignity	Assurance, Objectivity, Defensiveness, Blame Avoidance, Tolerance, Supplication
5. Achievement Standards	Achievement, Conjunctivity, Narcissism, Energy, Understanding, Counteraction, Order
6. Orderliness	Deference, Deliberation, Order, Harm Avoidance
7. Practicalness	Practicalness, Sex, Dominance, Science

The Orderliness factor suggests an environment which tends to be supportive in nature. In general, there seems to be a press for organization, reflectiveness, and compliance.

The Practicalness factor suggests concern in the environment for being useful, productive, and objective. A press exists for being assertive and masculine.

In a second-order analysis three factors were extracted from the seven first-order factors. The first-order factors 1 through 5 compose the second-order factor (I—Developmental Press); the content of this factor seems relevant to personal growth and development. The next two factors extracted (II—Orderliness and III—Practicalness) are limited to a single first-order source. Thus, the findings of this second-order analysis suggest a general factor and two unique factors.

Three other factorings have been carried out, two by Kight and Herr (1966) and one by Mitchell (1968a). The Kight and Herr analyses used two samples of 725 and 748 students from two different high schools. Six factors were extracted from the first sample using Kaiser's varimax procedure, and five factors were extracted from

the second sample. However, only the first four factors in each sample could be interpreted. These factors were named Social-Intellectual Avoidance, Inferiority Reaction, Compulsivity and Restraint, and Heterosexual Dominance. Mitchell, in his analysis, used 2,819 students (seniors) in 11 high schools. Four factors were extracted using the varimax criterion. The rotated factors were labeled Strong Intellectual Orientation, School Activities, Negative Attitude Toward the Environment, and Strong Environmental Control.

The four factor analyses thus described suggest not only commonalities but also differences. In general, the equamax procedure seemed to have produced more interpretable factors.

Validity data are limited for the HSCI. There is evidence that the factor structures of the HSCI, the CCI, and the Organizational Climate Index are similar, suggesting there may be a common structure underlying these indexes (Stern, 1970). A few studies have used the HSCI scale scores to differentiate among high school environments. Walker (1964) found many differences between two progressive schools and two more traditionally oriented schools. He scored the HSCI according to the CCI factor structure. In one study, Stern (1961) asked a group of incoming freshmen to respond to the HSCI in terms of the high school they had attended. Stern determined that different groups of students (public school, private preparatory, and parochial) described their respective high school press in ways which differed significantly from one another. More specifically, the groups with varying high school backgrounds differed on 27 of the 30 HSCI scales. In a more recent analysis using 947 students, Stern (1970) has found institutional differences among 12 high schools.

Several studies have explored the relationships between HSCI scale scores and other criteria. In one such study, Herr (1965) investigated the relationships between HSCI scale scores and other variables. Sex differences, mental ability as measured by IQ, grade level, parochial or public school background, and socioeconomic background were all associated in varying degrees with the students' perceptions of the environment. These findings suggest that differential perceptions of particular press do occur and that these perceptions may be related to other sources. Similar results have been presented by Mitchell (1968b). In his study, press profiles tended to be related to student religious background, socioeconomic status, and attitudinal conformity. Hansen and Herr (1964) also found press differences between students varying on attendance rate: truants perceived a stronger intellectual climate and more emotional constraints than did a group of students attending school regularly (matched for IQ, age, and socioeconomic background).

Student perceptions of the environment (as determined by scores on the HSCI) in guidance and nonguidance high schools were explored by Kasper, Munger, and Myers (1965). Five schools that had a certified guidance counselor for at least 3 were compared with five similar schools that had never had a counselor. The showed that guidance schools tended to encourage individualism and

initiative, while nonguidance schools seemed to be characterized by group-centered activity and conformity to authority.

The scale reliabilities for the HSCI have been estimated by means of the Kuder-Richardson formula 20 for 739 students from nine high schools (Stern, 1970). The values compare favorably with those for the CCI. No test-retest data are available.

In summary, the HSCI was constructed to measure the high school environmental press. Similar to the CCI, the basic assumption underlying the HSCI is that the environmental press may be inferred from aggregated behavioral perceptions. The index measures 30 kinds of press analogous to the need scales of the AI. Validity and reliability data are limited, but those which do exist tend to be supportive.

Organizational Climate Index. The initial impetus behind the Organizational Climate Index (OCI) was to develop an instrument which would be used to measure the press experienced by staff in elementary and secondary education. However, measurement of general organizational climate seemed more practical. Therefore, the OCI was operationalized to accomplish this purpose. Thus the OCI (Form 1163) is a general instrument that may be used to measure formal administrative structures. Form 1163 was derived from an earlier version (Form 662) based on the CCI, HSCI, and the Evening College Characteristics Index. As with the CCI and the HSCI, the OCI is based on the assumption that the environment may be defined in terms of press inferred from aggregated behavioral perceptions.

The OCI is a measure of 30 kinds of press, each of which is a logical counterpart to a particular need scale of the AI. The index measures environmental press conditions that may facilitate or impede the expression of needs. Like the CCI and the HSCI, this Index is composed of 300 items about the environment, grouped into 30 scales (see Table 10) of 10 items each, to be answered True or False. The OCI is a self-administering questionnaire requiring about 15 minutes of response time. Currently, the OCI is recommended for research rather than applied use in administrative settings (Stern, 1970).

The factor structure of the OCI has been explored using three different samples. One sample consisted of 2,505 Peace Corps trainees enrolled in 63 training programs. In the factor analysis of the OCI data, six factors (see Table 16) were extracted using the principal components and normal equamax procedure. The factors accounted for 53.7% of the common variance in the Peace Corps sample. The following are brief descriptions of the factors.

The Group Life versus Isolation factor stresses an environment where people have opportunities to be outgoing, friendly, and cooperative in group interactions and in play. In addition, the environment encourages service to others.

TABLE 16

First-Order Organizational Climate Factors (OCI) for the Peace Corps Sample

Factor title	Contributing scales
1. Group Life versus Isolation	Affiliation, Supplication, Exhibitionism, Nurturance, Play
2. Intellectual Climate	Reflectiveness, Humanities-Social Science, Understanding, Sensuality, Ego Achievement, Fantasied Achievement
3. Personal Dignity	Assurance, Objectivity, Tolerance, Conjunctivity, Counteraction
4. Achievement Standards	Energy, Achievement, Adaptability, Work, Counteraction
5. Orderliness	Order, Narcissism, Conjunctivity, Practicalness, Harm Avoidance, Sameness, Deliberation
6. Impulse Control	Blame Avoidance, Deference, Prudishness, Work, Noncounteraction, Placidity

The Intellectual Climate factor reflects an environment that is concerned with providing a well-rounded intellectual and social experience. Relevant experiences may include intellectual activities, involvement in social action, and concern for improving man's conditions.

The Personal Dignity factor suggests an environment that emphasizes individual responsibility and personal autonomy. Programs that score high on this factor tend to minimize direct supervision.

The Achievement Standards factor encourages the completion of tasks and the maintenance of high levels of motivation to succeed. Personal standards of achievement are emphasized.

The Orderliness factor suggests a concern for routine administrative detail. Supervision and rules are stressed in order to maintain the structure of the program.

The Impulse Control factor suggests an environment that is repressive in nature, one which most likely stimulates deferent behavior.

The six factors found in this study have been intercorrelated and refactored as before, resulting in the extraction of two second-order factors accounting for 66.3% of the common variance. First-order factors 1 through 4 make up the second-order factor I (Developmental Press). This second-order factor indicates an environment which encourages intellectual and interpersonal activity. High scores on the factor suggest opportunities for friendly social interactions, personal responsibility, high achievement standards, and intellectual experiences. The second-order factor II (Control Press) consists of factors 5 and 6 and a negative loading on factor I. This factor generally focuses on the degree to which the program stresses rules and administrative procedures and restricts individual expression.

The second sample to be factor analyzed consisted of 931 teaching and administrative staff of 43 elementary, junior, and senior high schools in a city school district. (The analyses are discussed thoroughly in a study by Steinhoff, 1965.) In the analysis of these data, six factors were extracted accounting for 60.7% of the common school district variance (see Table 17). The following is a brief description of each factor.

TABLE 17

First-Order Organizational Climate Factors (OCI) for the School District Sample

Factor title	Contributing scales
1. Intellectual Climate	Humanities-Social Science, Science, Reflectiveness, Understanding, Fantasied Achievement, Sensuality, Ego Achievement, Exhibitionism, Change
2. Achievement Standards	Counteraction, Energy, Achievement, Emotionality, Ego Achievement
3. Practicalness	Practicalness, Nurturance
4. Supportiveness	Assurance, Tolerance, Objectivity, Affiliation, Conjunctivity, Supplication, Blame Avoidance, Harm Avoidance, Nurturance
5. Orderliness	Order, Narcissism, Adaptability, Conjunctivity, Deference, Harm Avoidance
6. Impulse Control	Work, Prudishness, Blame Avoidance, Deliberation, Placidity, Inferiority Avoidance

The Intellectual Climate factor, noted previously, suggests an environment that stresses intelleetual activity, social action, and personal effectiveness.

The Achievement Standards factor stresses hard work, persistent striving, and achievement.

High scores on the Practicalness factor suggest an environment that encourages being useful and friendly.

The Supportiveness factor implies an environment that encourages movement toward people. Although the environment does attempt to satisfy dependency needs, the integrity of the individual is respected.

High scores on the Orderliness factor indicate an environment that stresses organizational structure, respect for authority, and conformity to community pressures.

The Impulse Control factor implies an environment that offers few opportunities for personal expression. Impulsive behavior is not encouraged.

A second-order analysis yielded two familiar factors which accounted for 77.8% of the variance. First-order factors 1 through 5 loaded on the first second-order factor, Developmental Press (I). As noted before, such a factor pertains to an environment that stresses intellectual and interpersonal activity. Impulse Control has the highest loading on the next second-order factor, Control Press (II). The cognitive variables, Intellectual Climate and Achievement Standards, load negatively on this second factor. The content of this factor suggests a restricted environment with limited opportunity for personal expression.

The third sample that has been factor analyzed is an industrial sample made up of 214 cases from three industrial sites. Eighty-six subjects in Alaska, as well as 13 additional subjects who had left the site, described the environment. Other subjects (N = 62) who were in the Near East, and 13 who had left that location, reported their perceptions of the environment. The final group of subjects (N = 35) were from an isolated area in the United States. The personnel participating at each site included engineers, electrical and mechanical technicians, and clerical staff. The factorial structure of the OCI was examined using this sample. Six factors were extracted using the equamax procedure (see Table 18). The factors accounted for 63.1% of the industrial sites' variance. A brief description of each factor is presented below.

The Intellectual Climate factor suggests an environment that is concerned with the social, philosophical, and political implications of the work task. However, there is limited opportunity for aesthetic experience, and the environment encourages the control of aggression and the maintenance of personal appearance.

TABLE 18

First-Order Organizational Climate Factors (OCI) for the Industrial Sample

Factor title	Contributing scales
1. Intellectual Climate	Ego Achievement, Humanities-Social Science, Reflectiveness, Nurturance, Science, Narcissism, Understanding, Exhibitionism, Blame Avoidance, Fantasied Achievement
2. Organizational Effectiveness	Energy, Practicalness, Achievement, Supplication, Adaptiveness, Conjunctivity, Affiliation, Exhibitionism
3. Personal Dignity	Assurance, Tolerance, Objectivity, Affiliation, Conjunctivity, Supplication, Harm Avoidance
4. Orderliness	Order, Harm Avoidance, Conjunctivity, Adaptiveness, Narcissism
5. Work	Work, Prudishness, Deliberation, Inferiority Avoidance, Blame Avoidance
6. Impulse Control	Sameness, Noncounteraction, Placidity, Deference, Puritanism, Deliberation

The Organizational Effectiveness factor stresses the establishment of group achievement standards rather than promoting individual competitiveness.

A high score on the Personal Dignity factor suggests a press for minimal direct supervision and the participation of all employees in the administrative process. The environment encourages mutual trust.

The Orderliness factor implies a press for administrative structure in order for participants to function effectively.

The Work factor suggests an environment that stresses personal restraint and task-oriented behavior.

High loadings on the Impulse Control factor indicate an environment that emphasizes the maintenance of routine. In addition, the environment tends to discourage originality and reward bland behavior.

The six industrial sites' factor scores have been refactored. The resulting factor structure suggests two unrelated second-order factors that account for 80.5% of the common variance. The two second-order factors once again indicate a Developmental and a Control dimension. Factors 1 through 4 load on a Developmental Press (I) factor. A high score on this factor suggests that the environment stresses intellectual development, personal autonomy, and group achievement. First-order factors 5 and 6 load on a Control Press (II) dimension, stressing concentration on work and personal restraint.

Validity studies pertaining to the OCI are few. As previously noted, there is evidence that the factor structures of the CCI, HSCI, and OCI seem to be related, thus suggesting a common underlying structure of these indexes. Other data indicate that the OCI is able to differentiate between various organizational environments. For the three samples previously discussed, analysis of variance was conducted for the 30 OCI scales: all scales differentiated between the 63 Peace Corps programs ($p < .001$); in the school district sample all but three scales differentiated the 43 school buildings ($p < .001$); and for the industrial sample, 20 of the 30 scales discriminated between the sites ($p < .05$). Overall, the school environments tended to be the most constrained, the Peace Corps programs the most flexible and spontaneous, and the industrial sites the most competitive.

The three samples were also analyzed in another way (Stern, 1970). Analysis of variance was carried out for the rescored first-order factors extracted from the factor analysis for each sample, with the following results: for the Peace Corps sample all factors discriminated between the programs ($p < .001$); although all factors differentiated the schools in the district ($p < .001$), only factors 3, 4, and 5 discriminated between them by grade levels (elementary, junior, and senior levels); for the industrial sample, significant differences were found between the three sites on all factors. Analyses of variance (with attendant computation significance tests) were also done on the rescored second-order factors for the school district sample. The two second-order factors discriminated between the schools in the district, but only the Developmental Press factor differentiated between the grade levels. In sum, these findings lend some support to the validity of the OCI.

To explore the reliability of the OCI, the Kuder-Richardson formula 20 has been used. For each of the three described samples KR-20 values were computed for the 30 scales, and the first-order and second-order factors. In general, the estimates of reliability are acceptable and comparable to the values for the CCI.

In sum, the OCI was developed to measure the organizational climate of an environment. It is believed that the instrument may be used in all administrative settings, academic or otherwise. Like the CCI and the HSCI, the rationale behind the OCI is that organizational press may be inferred from consensual behavioral perceptions of informed inhabitants (staff, employees, trainees, and teachers or the

like). The 30 press scales measured by the OCI are analogous to the need scales of the AI. Few studies have been conducted using the OCI, but the limited data available do tend to support the reliability and the validity of the scales.

Evening College Characteristics Index. The Evening College Characteristics Index (ECCI) was developed to measure the press of the nonresidential college, the community college, or the 2-year junior college. In constructing the ECCI, items have been included that represent either the day school or the evening college. However, Form 161 is still quite similar to the CCI in item content; it is also similar to the other three indexes in terms of the basic rationale.

Like the other indexes, the ECCI is a measure of 30 kinds of press analogous to the need scales of the AI. In structure the ECCI is composed of 300 items grouped into 30 scales (see Table 10) of 10 items each; again the response format is true or false. The Index is self-administering and requires about 15 minutes of response time. At this point in time, the ECCI Form 161 is recommended only for research use.

The factor structure of this index has not been explored. Data are available for only one institution. This sample consists of 2,327 students who responded to the ECCI at the University College, Syracuse University, in 1961. Stern (1970) has used 475 respondents in 19 categories to explore the ability of ECCI scale scores to differentiate among groups within one environment. Some of the groups included were matriculated and nonmatriculated students, undergraduate students, faculty, administration, etc. The 19 groups were compared by pairs. The findings showed that 24 of the 30 ECCI scales discriminated among the groups ($p < .001$). These results are encouraging enough, but much work clearly remains to be done.

Common Environmental Factors

As shown in Table 19, a review of the factor analyses on the CCI, the HSCI, the OCI-School District (SD) sample, OCI-Peace Corps (PC) sample, and OCI-Industrial (GE) sample suggests a common structure underlying the three indexes (Stern, 1970). The interlacing loadings from the factor analyses suggest six basic factors with limited variability across situations and instruments. A seventh factor involves one common loading across the CCI, HSCI and OCI-SD sample.

Summary

To assess environmental press the CCI, the HSCI, the OCI, and the ECCI were developed as counterparts to the AI. These environmental press conditions are seen as facilitating or impeding the expression of certain needs or response patterns. The basic rationale behind each of the indexes is that press is reflected in consensual or aggregated behavioral perceptions, which in turn may be inferred from an individual's self-reports about environmental activities. All indexes require about

TABLE 19

Interrelationships between Environment Index Factors: CCI, HSCI, OCI-SD, OCI-PC, and OCI-GE

Common environment parameters	CCI	HSCI	OCI-SD	OCI-PC	OCI-GE
I. DEVELOPMENTAL PRESS					
1. Intellectual Climate	2. Intellectual Climate	1. Intellectual Climate	2. Intellectual Climate	2. Intellectual Climate	1. Intellectual Climate
	4. Academic Climate				
2. Achievement Standards	5. Academic Achievement	5. Achievement Standards	2. Achievement Standards	4. Achievement Standards	2. Organizational Effectiveness
	1. Aspiration Level[a]	2. Expressiveness			
3. Group Life	7. Group Life	3. Group Life		1. Group Life—Isolation	
	6. Self-Expression		4. Supportiveness		
4. Personal Dignity	3. Student Dignity	4. Personal Dignity		3. Personal Dignity	3. Personal Dignity

II. CONTROL PRESS

6. Constraint	10. Work-Play		6. Impulse Control [b]	6. Impulse Control	5. Work 6. Impulse Control
5. Orderliness	8. Academic Organization 9. Social Form	6. Orderliness	5. Orderliness	5. Orderliness	4. Orderliness [c]
7. Practicalness	11. Vocational Climate	7. Practicalness	3. Practicalness		

[a]CCI Group Life loads on Control.

[b]Impulse Control is the only OCI-SD factor with a high Nondevelopmental loading.

[c]OCI-GE Orderliness loads on Developmental

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15 minutes of testing time. The basic format for each of the indexes is the same. Data tend to support the reliability and the validity of the CCI. The limited reliability and validity data available for the HSCI and the OCI tend to be supportive. Regarding the ECCI, the only existing study indicates that the instrument is able to differentiate among various group perceptions within one environment.

Research

Research Directly Testing Theoretical Predictions

Need-press congruency and achievement. Few studies have examined the relationship between need-press congruency and achievement. Landis (1964) characterized students and colleges in terms of needs (using the AI) and environmental press (using the CCI) and then assessed achievement as defined by grade-point average. The sample included all new students enrolled at Messiah College during the 1962-63 academic year. Landis compared the achievement of students attending congruent and incongruent colleges and having appropriate and inappropriate need patterns. The findings did not support the prediction that need-press congruency would be positively related to achievement.

Two other studies seem to be relevant to this congruency issue. In one of these, Pace (1962) explored the relationships between need-press congruency and length of time in the environment. The AI and the CCI were administered to 296 students (males and females) at a North Carolina Negro teachers college. The findings showed that the need-press patterns for the sophomore, junior, and senior classes were for the most part dissonant or incongruent. Distance coefficients indicated the dissonance between needs and press increased in moving from the sophomore class to the senior class. However, the findings for the senior class suggested low need-press congruency was positively related to academic achievement (point-hour ratio). Thus, the less congruent a senior student's profile of needs was with the press of his environment, the higher his academic achievement tended to be. In essence, then, Pace found the inverse of what he had predicted. Kirkland (1967) hypothesized a positive relationship between need-press congruence and achievement (via cumulative grade-point average) for the school year. The sample was 170 freshman students responding to the AI and the CCI. The results did not support the hypothesis. However, the correlations that approached statistical significance did suggest a possible relationship between high grade-point average and low need-press congruency.

Taken together, the research reported in this section does not tend to support the congruency hypothesis derived from the overall theory. One study suggests no relationship between need-press congruency and achievement. Two additional studies imply that low need-press congruency, contrary to theoretical expectations, may actually stimulate achievement.

Need-press congruency and satisfaction. Research testing this particular congruency hypothesis is sparse. Of two studies conducted in this area, one supports the congruency hypothesis and one does not. Landis (1964), in a study previously mentioned, measured students and colleges in terms of needs and press, and then assessed satisfaction as measured by a scale he constructed himself. His sample included all new students enrolled at Messiah College. The prediction that need-press congruency would be positively related to satisfaction was lent credence by the results. Raab (1963) also explored congruency and satisfaction in a university environment, using a sample that included 100 college juniors and 100 college freshmen. All students responded to the AI and the CCI. The juniors were designated as a control group. Raab assumed that these students would report higher satisfaction because they had been in the environment longer. Based on this assumption, he predicted that need-press congruency for freshmen and juniors would be different. His results suggested no relationship between congruency and satisfaction for either group.

Need-press congruency, attrition, and stability. One study has explored the congruency and attrition hypotheses. Landis (1964), previously cited, related need-press congruency to attrition, using as his sample the freshman class at Messiah College. The results of this part of his more general study show a significant relationship between low congruency and student withdrawal from the college. Students with needs at variance with the college press withdrew from the college in significantly greater numbers than did students having needs more compatible with the press.

Again only one study has explored the congruency and stability hypothesis. Herr and Moore (1967) studied need-press congruency and the stability of college major choice. Their sample consisted of 158 students who completed the AI, the CCI, and a questionnaire of future educational plans. The CCI and the questionnaire were completed in the spring of the freshman year. The AI was completed in the autumn of the year. Comparisons were made between students planning to remain in college in the same major and students changing major, transferring, or withdrawing. The findings indicated that students with stable plans had greater discrepancies between needs and environmental press.

Need-press congruency and student-college fit. Stern (1962a, 1965) explored the student-college fit area using 1,993 junior and senior college students from 32 selected schools. The sample consisted of 7 independent liberal arts colleges (N = 460), 7 university affiliated colleges (N = 543), 8 denominational colleges (N = 397), and 10 technical schools (N = 593). Four of the technical programs focused on engineering (N = 240), three on teacher training (N = 197), and three on business administration (N = 156). All students responded to the AI and the CCI. These data were reduced to three independent dimensions as extracted by a second-order factor analysis (dependency needs vs. autonomy, emotional expression vs. control, and an intellectual factor). The end point of this procedure was to represent the

press of each school and the needs of its student body as a cluster around a resultant point in a three-dimensional cube. Comparisons between schools and within schools in terms of needs or press were thus simplified. Table 20 summarizes the mean distance between A1 and CC1 resultants for the 32 schools of six types. The A1 x A1 relationships provide a measure of student uniqueness, as shown by the average distance between each student body and every other student body with respect to needs. The business administration students seem to be least like the others, a result which is probably due to their low intellectual strivings.

A measure of institutional uniqueness was developed in the same way—that is, by computing the average distance between each institutional press. The private liberal arts colleges seem to be most unique, a result which is probably because of their high intellectual press and strong nonconformist trends.

A measure of internal congruency was determined by computing the average distance between each student body and the press of their own institution. The private liberal arts colleges appear to present a press that is most different from the needs of its students. This result suggests that these colleges tend to stimulate intellectual achievement and personal autonomy among their students. Therefore, perhaps the better interpretation of the results is not that the private liberal arts colleges are unlike their students but that they are ahead of them.

In general, when the needs of the various student bodies are compared with the press characteristics of the various environments, the findings show marked similarity between student and college.

Other Relevant Research

The studies included in this section are more indirectly relevant (than studies in the preceding section) to predictions about the effects of need-press congruency. Studies included here have altered the definition of congruency. One (or more) group(s) of students responded to the need index and one (or more) group(s) of students responded to the press index. But none of the students responded to both indexes.

Need-press congruency and achievement. The research bearing indirectly on the prediction of a positive association between need-press congruency and achievement hypothesis is not supportive. A study by Keith (1965) suggests no relationship; and one by Lauterbach and Vielhaber (1966) suggests an inverse relationship.

Keith (1965) studied students who had completed at least four semesters of work at the University of Alabama. Sixty students from each of seven undergraduate visions were administered the A1 and the CC1. One-half of the students from each

TABLE 20

Mean Distance between AI and CCI Resultants for 32 Schools of Six General Types

Type	Number	Measure: Uniqueness (Increasing distance): Students (AI x AI)	Measure: Uniqueness (Increasing distance): Institution (CCI x CCI)	Congruence of students with own institution (Decreasing distance: AI x CCI)
Education	3	1.61	3.01	1.76
Business adm.	3	2.00	3.25	1.74
Engineering	4	1.47	2.89	1.47
Private lib. arts	7	1.64	3.68	2.55
Denominational	8	1.79	3.40	2.03
Univ.-affiliates	7	1.27	2.91	1.83
Combined types	32	1.61	3.26	1.89

Source: G. G. Stern, Environments for learning. In R. N. Sanford (Ed.), *The American college: A psychological and social interpretation of higher learning*. New York: Wiley, 1962. Copyright 1962 by John Wiley and Sons, and reproduced by permission.

division were given the AI, and the other half responded to the CCI. Achievement was defined by the college grade-point average. Pearson product moment correlations were computed to determine the relationships of academic success and need-press congruency. None was found.

Lauterbach and Vielhaber (1966) examined the congruency hypothesis by investigating need-press and expectation-press indexes as predictors of achievement at West Point. These indexes were derived from cadets' responses to the CCI under differential conditions. One group of cadets (N = 383) involved in freshman orientation was asked to complete the CCI in terms of how they preferred the environment. These scores were regarded as indicators of expectation. A measure of the press of the environment was derived from the CCI responses of an earlier freshman class (N = 646). These cadets had completed the CCI under standard conditions midway through their first year. The need-press indexes and the expectation-press indexes were correlated with academic performance (grade-point average and grades in military subjects) and nonacademic performance criteria (aptitude for service ratings and physical education average). Aptitude for service rating was determined by peers' and superiors' ratings of a cadet's leadership potential. Neither of the indexes was significantly correlated with the nonacademic criteria of cadet achievement. However, the expectation-press indexes were correlated with the academic criteria; the closer the expectation profile was to the press profile, the better the cadet's academic achievement. The findings also showed a relationship between need-press indexes and the academic-criteria but one in the opposite direction from that predicted: the less congruent a cadet's CCI profile of preferences (needs) was with the press, the higher his academic achievement tended to be. Cadets who preferred the educational environment most different from the experienced perceptions of cadets tended to be the most successful academically. It should be noted, however, that all correlation coefficients computed in this study were modest, ranging from −.21 to +.24. In addition, the study used the CCI as a measure of needs rather than the more appropriate AI.

Need-press congruency and satisfaction. Keith (1965), in the study previously mentioned, investigated the congruency and satisfaction hypothesis using students from seven different divisions of the University of Alabama. One-half the students of each division responded to the AI and the other half responded to the CCI. Those students responding to the AI also were administered a satisfaction questionnaire developed by the author. Pearson product moment correlations were computed to determine the nature of the relationships of satisfaction with undergraduate division and need-press congruency. No significant relationships were found. Need-press congruency did not seem to be related to student satisfaction in enrolled division.

In a related, descriptive study Sagen (1963) explored the satisfaction with present position of faculty members in selected liberal arts colleges. A sample of 195 faculty members from six different colleges completed the AI and the Hoppock Job

Satisfaction Blank. Students (N = 213) responded to the CCI for the colleges. The results showed that faculty members characterized as Cautious-Controlled were more satisfied with their positions and that those classified as Critical-Independent were less satisfied.

Need-press congruency and attrition. Fishburn (1967) derived discriminant functions predicting voluntary attrition at West Point from the AI and CCI scales and factors. Cadets for the study came from the Class of 1969 (N = 198) and the Class of 1968 (N = 190). The cadets responded to the AI and the CCI, respectively, within their first week of attendance at the Academy. Therefore, none of the cadets responded to both indexes. The sample was divided into two groups, successful cadets and attrition cadets. Cadets who remained at the Academy through November, 1966, were categorized as successful. There were 731 successful and 98 attrition cadets who had taken the AI and 361 successful and 90 attrition cadets who had taken the CCI. The successful groups were reduced to 100 cadets each by random selection. In the development of the discriminant equations 5 AI factors, 18 AI scales, 7 CCI factors, and 13 CCI scales were used, respectively, as independent predictors. The CCI factors achieved the highest percentage of correct classification in the attrition group. The highest percentage of correct classification in the successful group was predicted by the AI scales.

Need-press congruency and dimensions of culture. All the work cited in this section relates AI and CCI scale or factor means across schools. In each study the resulting correlation matrix shows the kind of academic environment in which a particular student need is maximized and the kinds of students to be found in any given environment. Such findings have stimulated the hypothesis that the variables of this need-press matrix contain the dimensions of college cultures—a college culture being defined as a composite of the environmental press and the needs of its inhabitants. The culture model analysis has been used to test this hypothesis.

One such culture model analysis has been completed by Cohen (1966) in order to determine the relationships between the personalities of the students and the environmental characteristics of the institution. A total of 6,400 students in 55 colleges and universities responded to the AI and the CCI. Not all students, however, responded to both indexes. The schools and programs involved in the sample were variable; they included engineering, business administration, liberal arts, forestry, education, home economics, nursing, art, and denominational schools. The scale measures across the 55 student bodies (AI) and institutions (CCI) were intercorrelated. A similar correctional matrix was computed for the AI and CCI factor means. The factor matrix yielded the clearest factor structure. Five second-order factors were extracted, representing the congruence of student needs and environmental press. Each factor draws upon both AI and CCI first-order factors reflecting composite dimensions as student-institution cultures. The five culture factors named Expressive, Intellectual, Protective, Vocational, and

Collegiate (see Table 21) accounted for about 83% of the common variance. The following are brief descriptions of the culture factors.

The Expressive culture factor suggests a non-work-oriented climate inhabited by students with social interests. Students tend to be nonconforming and unconcerned about being organized. In general, the culture tends to be aesthetic, friendly, and nonpractical. Students in this culture are concerned about personal development and self-actualization. Colleges exhibiting high scores on this factor are for the most part small independent liberal arts colleges (women's colleges). Absence of an Expressive culture suggests a culture emphasizing constraint, masculinity, and vocationalism.

TABLE 21

Composite AI x CCI Second-Order Culture Factors

	Factor title	Contributing factors (first-order factors)
1.	Expressive	AI: Expressiveness-Constraint, Applied Interests*, Sensuousness, Orderliness*, Friendliness CCI: Vocational Climate*
2.	Intellectual	AI: Intellectual Interests, Motivation CCI: Aspiration Level, Academic Climate, Intellectual Climate, Vocational Climate*, Self-Expression, Academic Achievement
3.	Protective	AI: Closeness, Submissiveness, Audacity-Timidity*, Orderliness, Sensuousness, Self-Assertion* CCI: Group Life, Social Form, Academic Organization, Self-Expression
4.	Vocational	AI: Egoism-Diffidence, Self-Assertion CCI: Vocational Climate
5.	Collegiate	AI: Friendliness, Self-Assertion CCI: Play-Work, Student Dignity*, Academic Achievement*, Social Form, Academic Organization*

*Negative loadings

The Intellectual culture factor is very similar to the Intellectual Climate second-order factor of the CCI. This factor suggests a culture that has high standards of achievement, opportunities to develop self-assurance, and quality academic staff and facilities. Students in this culture tend to be highly motivated and interested in intellectual activities. Colleges high on this factor are mainly elite liberal arts colleges.

The Protective factor implies a culture that is characterized by a highly organized, supportive environment and a relatively dependent, submissive student body. Colleges high on this factor are primarily denominational (women's colleges). Business administration, engineering programs, and liberal arts colleges tend to score low on this factor.

The Vocational factor suggests a culture characterized by practicality, conventionality, and an authoritarian structure. Students in this culture tend to be assertive, egocentric, and manipulative. Applied programs (business administration and engineering) tend to score high on this factor. The small liberal arts colleges tend to score low.

The Collegiate factor implies a culture that emphasizes social life and recreation. Academic standards tend to be ambiguous and administrative practices situational. In general, students in this culture tend to be friendly, cooperative, and socially assertive.

The data have been further analyzed by computing culture factor scores and by using analysis of variance to determine if the factors could successfully discriminate among colleges. The findings indicated that the five culture factors are capable of differentiating among the colleges. An additional analysis has identified six differences on the factors. Women students tended to be associated more with Expressive and Protective cultures. Men students were found primarily in Vocational and Collegiate cultures. No sex differences were identified for the Intellectual culture. The correlational matrix between the second-order culture factors is also of interest. The correlations ranged from −.667 to +.455. The size of these relationships supports the unsurprising assertion that in practice student cultures tend to overlap.

In a descriptive analysis of interest of the same study two-part scores (AI and CCI) were computed for each culture factor in order to examine need-press congruency. In general, the denominational colleges evidenced the most congruency, with little discrepancy between environment and student patterns. The greatest incongruency was found among the liberal arts colleges and the business administration programs. Similarly, the large universities reflected low need-press congruency.

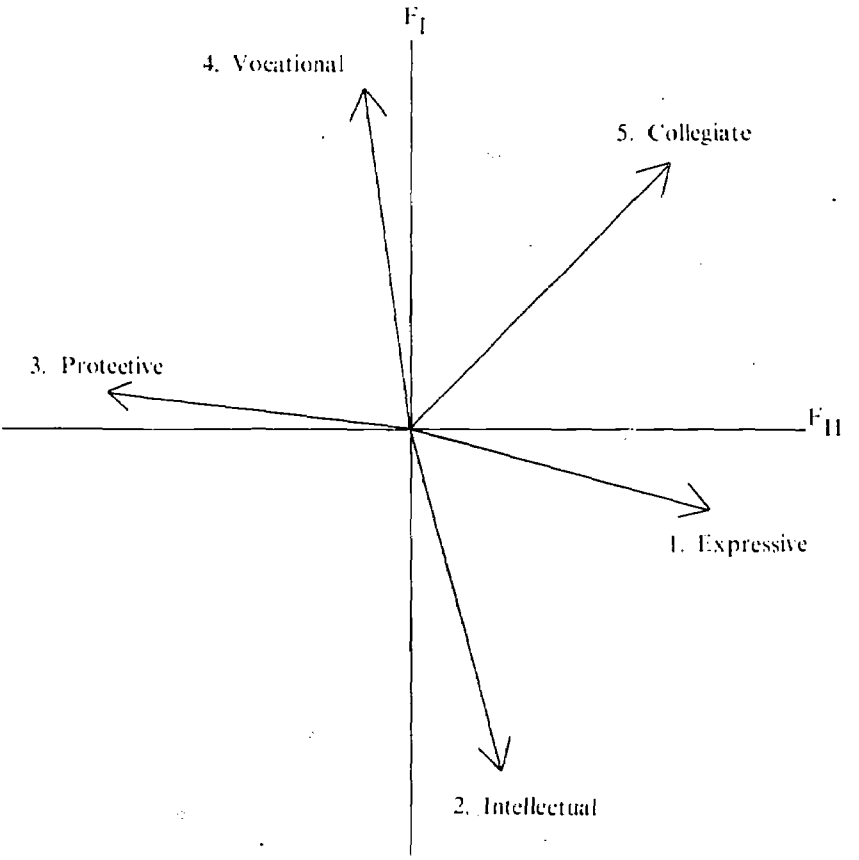
In a third-order analysis in the same study two factors were extracted accounting for 70.6% of the variance. The first third-order factor has loadings on the Vocational, Intellectual (negative), and Collegiate culture factors. The second factor

loads highly on the Expressive, Protective (negative), and Collegiate culture factors. These factors suggest a Nonintellectual-Vocational-Collegiate axis and a Protective-Constricted (Expressive-Collegiate) one (see Figure 7). The two factors were used to compute third-order axis scores. In addition, need and press culture component scores were computed. Analysis of variance was used to determine if the culture total scores, the need component scores, and the press component scores could each differentiate among individual colleges, various types of colleges (independent, denominational, university affiliated, etc.) and various academic areas (administrative and legal sciences, applied and technical, education, humanities, natural science, and social science). In general, the findings indicated that these scores (culture total, need component, and press component) were able to discriminate among individual colleges, types of colleges, and academic areas. Given these findings, important cultural differences among colleges, types of colleges, and academic areas do seem to exist. In addition, the analysis revealed the extreme diversity among students regardless of the school they were attending. Furthermore, the findings suggest that student characteristics (need component) are clearly of less significance in establishing the five cultures than are the institutions themselves (press component).

A different culture analysis has been conducted by Steinhoff (1965) using elementary, junior high, and senior high schools. Teaching and administrative staff responded to the AI (N = 934) and the OCI (N = 931). First-order factor means across the 43 schools were rotated in two second-order analyses. The first analysis yielded four factors, and the second produced six factors. The second AI x OCI joint factor solution seemed to be the most definitive; three of the factors (Achievement Needs, Submissiveness Needs, and Protective Culture) discriminated significantly between school levels. However, in this culture analysis only two of the six factors drew upon both the AI and the OCI first-order factors. Thus, the factor space consisted of three teacher personality factors (Achievement Needs, Submissiveness Needs, and Friendliness Needs), one school press factor (Developmental Press), and two building and staff culture dimensions (Emotional Culture and Protective Culture II). The six second-order factors and contributing first-order factors are shown in Table 22.

In a third-order analysis three factors were extracted. The first factor (Conventional) loaded on the Protective Culture and Achievement Needs (negative) factors. The second factor (Expressive) loaded highly on the Developmental Press and Emotional Culture factors. The third-order Warmth factor had high loadings on the Friendliness Needs and Submissiveness Needs factors.

In order to explore the meaning of the second-order factors, Hamaty (1966) related the factors to various dependent variables (pupil achievement and absenteeism, teacher absenteeism and turnover, and socioeconomic status) using a sample of 40 schools. The Protective Culture was negatively related to pupil absenteeism and positively associated with achievement in the high school (junior and senior).



Source: G. G. Stern. *People in context*. New York: Wiley, 1970. Copyright 1970 by John Wiley and Sons, and reproduced by permission.

Fig. 7. College culture factor circumplex.

However, this factor was positively correlated with high teacher turnover. The Achievement Needs factor was positively related to both teacher and pupil absenteeism in the high schools. The Emotional Culture factor was negatively

TABLE 22

Joint Second-Order AI x OCI Factors for the School District Sample

	Factor title		Contributing factors (first-order factors)
1.	Achievement Needs	AI:	Intellectual Interests, Motivation, Applied Interests, Audacity-Timidity, Self-Assertion
2.	Emotional Culture	AI:	Sensuousness, Egoism-Diffidence, Expressiveness-Constraint, Closeness
		OCI:	Impulse Control*
3.	Submissiveness Needs	AI:	Submissiveness, Closeness
4.	Friendliness Needs	AI:	Friendliness
5.	Developmental Press	OCI:	Intellectual Climate, Achievement Standards, Practicalness, Impulse Control*
6.	Protective Culture II	AI:	Orderliness, Expressiveness-Constraint*, Self-Assertion*, Audacity-Timidity*
		OCI:	Orderliness, Supportiveness

*Negative loadings

associated with pupil absenteeism in the elementary schools, but was positively associated in the junior high schools. In the senior high schools pupil achievement, teacher absenteeism, and teacher turnover were inversely related to this factor. The Friendliness factor was found to be highly related to the socioeconomic index of the high schools. In addition, this factor was inversely associated with pupil absenteeism in the junior high schools when socioeconomic differences were held constant. In general, the above cited relationships add to the meaning of the joint AI-OCI factors.

Summary

Research testing the need-press interaction theory is limited. The dearth of sound research in this area seems to be related to the technical problems involved in

associating needs with press for individuals. The two sets of scales are commensurate but difficult to relate on a scale for scale basis. In general, the few need-press congruency studies concerned with predicting achievement and satisfaction that do exist tend not to support the theory. The findings do not suggest that satisfaction and achievement behavior are functionally related to the person and the environment. However, when need and press scale or factor means across schools rather than persons are related, the resulting intercorrelations are both more interesting and more meaningful. Relationships in this area help to indicate the kind of academic environment in which a given need is maximized and the types of students to be found in any given environment. Two culture model analyses have explored the hypothesis that the mean between-schools need-press matrix contains dimensions of culture. Findings support this assertion, which suggests that behavior to some extent may be functionally related to needs and press.

Evaluation

As should be evident at this point, research on the need-press theory proper is limited. Much research has been carried out using just the AI or one of the environmental indexes. Studies using both the AI and CCI, however, are fewer. Moreover, the need-press congruency studies using AI-CCI scale scores across individuals for predicting achievement and satisfaction tend not to support the theory. The findings suggest that satisfaction and achievement behavior are not positively related to person-environment congruency. However, recent research using need and press scale or factor means across colleges suggests some congruency between the average level of student needs and environmental pressure. These findings indicate that students characterized by a certain need pattern tend to be found at institutions with appropriate press.

A problem inherent in the recent need-press research is that the scale or factor mean scores that are used tend to be more reliable than are the scores of individuals. This increase in reliability may increase the magnitude of correlations by reducing attenuation attributed to unreliability (Feldman & Newcomb, 1969, p. 133). In other words, correlations for need and press mean scores across institutions tend to be higher than AI-CCI correlations based on the scores of individuals. Thus, the AI-CCI correlations based on mean scores may simply reflect the smaller individual correlations (Feldman & Newcomb, 1969).

A further limitation is that at least on some of the scales there is a lack of parallelism between the needs measured by the AI and the press as measured by the CCI (Saunders, 1969; Stricker, 1967). The 30 sets of similarly named scales are a convenient way of exploring the hypothesis that each pair of scales measures a corresponding need and press. However, evidence indicates that not all of these hypotheses are supported.

Another question about the theory involves its relevance for graduate student populations as well as for noncollege populations. Some research has been conducted with high school students, Peace Corps programs, elementary staff, junior high staff, and senior high staff. However, longitudinal studies using more representative samples are still needed. As part of these additional studies, the validity of the need and press variables for older populations should also be determined. Indeed, a comprehensive study of needs and press of persons during the later years of life would probably contribute to a better understanding of older persons as well as helping to expand the need-press theory.

To date, there is very little in the theory that directly focuses on learning and change. The theory does not concentrate on the way in which past experiences and knowledge may be used in coping with existing personal and environmental problems. It would seem sensible to assume that if an individual accumulates knowledge about a given environment and identifies various reinforcement systems in the milieu, factors such as these would have important impacts on his or her behavior in future situations. Although behavioral change across situations is alluded to by Stern (1970), behavioral change as a function of the accumulation of responses or experiences is not explicitly discussed. Still, in regard to change, it is important to explore the *direction* of noncongruency as well as the *degree* of need-press congruency (cf. Well & Crowden, 1965). It may very well make a significant difference whether individual needs are stronger than press or whether press variables are more potent than needs. In analyzing the effect of the direction and distance of the incongruency on behavior, it seems possible that it might be found that some individuals in the face of incongruency would actually be able to change either their environment or themselves—and thereby function with a greater degree of effectiveness than would otherwise be the case. For example, two studies previously discussed (Kirkland, 1967; Pace, 1962) suggested that low need-press congruency may be associated with academic achievement. Another author (Pervin, 1967a) suggests that some stress or dissonance in the person-environment fit may stimulate personal growth and productivity.

The theory does not explain the process of need development. Stern does imply that individuals *develop* various need patterns or orientations, but he has not identified the developmental process as such. Murray (1938) refers to a need as an emergent from the immediate past; and thus the need seems to be a push from the rear, so to speak. The environment certainly seems to serve as a stimulus in arousing the needs, but this alone does not explain the developmental process.

A potential limitation of the theory involves the basic procedural assumption that an individual's needs may be inferred from his or her responses to specific activities on the AI. The assumption is that the self-reported preferences of individuals serve as a useful estimate of their actual behavior—an assumption that is not inevitably a good one. For example, the accuracy with which an individual is able to report typical behavior would seem to be related to his or her level of self-knowledge (Stern, 1970), which then implies that the link between reported and actual

behavior varies across persons. In any event, self-report inventories do not measure the actual occurrence, frequency, or intensity of specific behavior. Furthermore, instruments such as the AI do not require the individual to describe his *specific* behavior in *concrete* situations. Because behavior tends to change with variations in the situations in which it occurs (Mischel, 1968), personality tests such as AI are not really measures of behavioral dimensions--although they probably do elicit an individual's composite thoughts about his or her behavior.

Another limitation of the need-press approach, mentioned by Selvin and Hagstrom (1963), pertains to the CCI. In assessing college environments Stern and Pace have relied upon the consensual behavioral perceptions of students in the environment. This may seem reasonable enough when the questions focus on college characteristics--rules, the conduct of academic courses, and the nature of student activities. However, many of the CCI items are based on behavioral perceptions about group characteristics of the student body. For example, "Everyone has a lot of fun at this school." Selvin and Hagstrom suggest that it may be more productive to ask students about their own fun than about the fun of other students. A picture of the environment could then be compiled from aggregating student reports about their own feelings and activities. In their current form, CCI scores are not able to discriminate between public belief and private behavior. Likewise, the scores are not able to differentiate fiction from nonfiction. Fictitious perceptions of the environment may become social facts that have an impact on attitudes and behavior.

Selvin and Hagstrom also raise a question about the interpretation of CCI findings. Suppose that 75% of the students in college X reported that everyone has a lot of fun there, and only 45% of the students in college Y so responded. Does this really mean that students in college X have more fun than students in college Y? Perhaps so, but according to Selvin and Hagstrom the difference between the two sets of responses is one of consensus rather than fun. Thus, the interpretation of CCI scores involves some ambiguity since the scores reflect not only the *intensity* of environmental emphasis, but also the *amount of consensus* in the environment.

A further limitation of the CCI, in part documented in Feldman and Newcomb (1969), is that a student's responses to the index tend to be affected by his or her social situation or structural location in the environment, knowledge about the environment, and the nature of his or her involvement with college life. Thus, such things as a student's class level, major field, or residential setting may influence his or her perception of the total environment. To a much lesser extent a student's personality characteristics, attitudes, and values also tend to influence perception of the environment. These considerations suggest the importance of obtaining a representative sample of students at a college when using the CCI, and possibly differentially weighting the individual scores when "adding up" these individual scores to get a total environment score (Feldman & Newcomb, 1969).

The CCI has been criticized as being too psychologically focused to be used as an adequate measure of social structure (Feldman & Newcomb, 1969). For example, the CCI does little in the way of measuring the content and structure of the status system, the college's control structure, group norms, the reward and punishment system, the relationship of leaders to followers, structural cohesiveness of the environment, and the extent to which the environment is monolithic rather than pluralistic. In addition, the CCI makes no attempt to measure the environmental press which is exerted upon the university environment by the surrounding community or society. Essentially, the CCI is not associated with a theory of social structure; consequently, the instrument does not directly assess variables related to that type of theory, although some of this information is gathered tangentially.

A question may also be raised about an assumption basic to the CCI (Feldman & Newcomb, 1969). Pace (1969b) assumes—and this assumption has been built into the CCI—that shared awareness of students about their environment constitutes a press in the sense of exerting a directive influence on their behavior. This assumption is ambiguous because it is difficult to determine the extent of impact of various environmental characteristics on students as measured by the CCI. Items on the CCI tend to assess behavior as the individual perceives it. However, the individual does not make a personal judgment about the impact of the reported activity. In other words, CCI scores for the most part tend to represent what exists. According to Feldman and Newcomb (1969), the actual impact of the existing environment is probably related to the extent of shared awareness about the desirability of certain attitudes and behavior, the systems of rewards and punishments that serve maintenance functions (and other aspects of the social structure), and the degree to which individuals accept existing group values.

In reviewing the theory in terms of the more formal attributes of a sound theory, some interesting observations may be made. In general, the theory has limitations that affect its comprehensiveness. Evidence suggests that behavior is not necessarily a function of only needs and presses. Furthermore, as noted, the theory generally ignores the processes of need development, learning, and individual change. The theory has emphasized the psychological environment but has neglected the physical environment. Finally, the theory needs to be extended to the noncollege population, the larger segment of society; current research is making an effort in this direction.

Three assumptions underlie the theory. The basic assumption, drawn from Lewin, is stated clearly and explicitly. The next two assumptions are not explicitly stated, but they are implied by Stern in his earlier writings. The assumptions are logically consistent, the latter two being extensions of the basic assumption drawn from Lewin. The need-press concepts adopted from Murray are explicit, parsimonious, and operationally defined. However, the theory remains difficult to test empirically. The primary reason for this seems to be that some of the need-press scales are not parallel, or at least they are difficult to reconcile with one another on a

scale-for-scale (need-press) correspondence. In general, need-press congruency research across individuals tends not to support the theory. On the other hand, more recent research using scale or factor means across institutions suggests that behavior may be more functionally related to needs and press. However, there is some question about the statistical technique being implemented in this research. Further the theory is primarily descriptive; no attempt is made to explain the development of various need orientations. In regard to known empirical findings, Stern's work is fairly inclusive considering the evidence available in this area. He has drawn upon the work of Lewin and Murray in addition to many others. In general, the theory has stimulated research, but much of this research has focused on the measurement of needs or press rather than on need-press congruency and its effects. In other words, the research actually testing the theory is quite limited. In any case, the theory does seem to be of heuristic and practical value.

In the theory, both the person (needs) and the environment (press) are operationally defined by self-reported behavior. The person is defined in terms of needs as inferred from his self-reported behavior (that is, his response to the AI). The environment is defined in terms of press, which are inferred from aggregated self-reported behavioral perceptions, as measured by an environmental index (CCI). A limitation of the environmental definition is that it fails to assess how behavior is influenced by the physical nature of the environment. Data collected using the CCI are essentially reaction data and tend to lack objectivity. Stern has attempted to compensate for this limitation by aggregating individuals' perceptions of the environment; but even this procedure does not take into consideration the physical nature of the environment.

The future directions of the theory seem predictable to some extent. Plans are being made to develop other environmental indexes that would measure industrial, military, retailing, office, and community situations (Stern, 1970). The environmental indexes, in conjunction with the AI, may then be used to identify dimensions of culture (through the use of the technique of factor analysis). The next desirable step might be to relate the resultant dimensions of culture to variables of achievement and satisfaction. This line of need-press research might help to document the functional relationship of behavior to individual needs and environmental press.

Implications for Theory, Research, and Application

Theoretical Implications

Stern in his work suggests that each kind of environment should be measured independently. Therefore, new environmental indexes must be developed in order to measure the sorts of environments. The theoretical implication of this ...ement consideration is that the individual consistently may be operationally ... by the AI—his self-reported preferences and behavior vary within the 30

need dimensions—but in assessing a new kind of environment the operational definition must be changed. In short, the 30 environmental presses must be continually operationally redefined. Thus, in some respects, Stern like Barker is suggesting that the environment must be defined independently of behavior.

The need-press approach is in some ways similar to the subcultural approach and Barker's behavior-setting theory. The subcultures identified either by the subcultural approach or the need-press approach seem to be like large behavior settings. Barker and the subcultural approach stress the significance of the environment. Environments tend to select and to shape the behavior of people who inhabit them. Stern's suggestion, however, is different. He suggests that in some cultures, press variables may be stronger than need variables; but in other cultures, need variables may be more potent than press variables. Put otherwise, in some behavior settings the environment tends to shape behavior, but in other behavior settings the individual may tend to shape the environment.

Implications for Research

The two culture model analyses (Cohen, 1966; Steinhoff, 1965) using the AI x CCI and the AI x OCI first-order factor means across institutions have suggested a new and perhaps more productive line of research for need-press theory. The results of these analyses imply that different environments exhibit differential cultures. This hypothesis will no doubt be tested shortly by Stern using the HSCI and the ECCI. It is known that Stern (1970) plans to develop other environmental indexes to assess industrial, military, retailing, office, and community environments. Once culture factors have been identified for a given environment, they then may be related to various outcome variables concerning achievement, satisfaction, stability, creativity, etc.

In order to study further the need-press cultures, Stern (1970) has developed three divergence indexes—dispersion, deviancy, and dissonance. The dispersion index is concerned with the source of the individual's variation from his or her group culture. Three possible sources of the dispersion of students around their group mean have been identified: total culture, need component, and press component. Thus, it is possible to compute a cultural dispersion index, a personality (need) component dispersion index, and an environmental (press) dispersion index. Each index is computed by simply subtracting the individual score from the group mean. For example, the cultural dispersion index for a student may be computed by subtracting his or her individual culture score from the group mean culture score. The dispersion or scatter of scores around the group mean Stern (1970) has labeled the cultural heterogeneity of an institution. Culturally homogeneous institutions presumably should have a stronger impact on students than culturally heterogeneous institutions. This exact hypothesis has not been tested, but culture diversity (cultural, need, and press dispersion) does appear to be related to a number of problems (administrative quality, faculty quality, academic quality, social and political freedom, and number of problems reported).

The deviancy index, defined in terms of the individual's distance from the school mean, is a measure of the student's deviancy in the group. A deviancy index may be found for the total culture, the need component, and the press component.

The dissonance index measures the degree of divergence between the need component and the press component for a given individual. This need-press divergence indicates intra-individual discrepancy, which Stern (1970) refers to as cultural dissonance. Therefore, the distance from needs to press serves as a quantitative measure of dissonance. Similarly, the average of need minus press differences for a group of individuals is considered to be a measure of group dissonance. It is also possible to focus on the difference between the average need score and the average press score for a group of individuals for the purpose of identifying the degree of group congruence.

Finally, Stern (1970) and others (Webb & Crowder, 1965) stress the importance of exploring the direction of incongruency as well as the degree of individual-environment congruency. Different degrees and directions of individual-environment congruency may have differential effects on satisfaction, thinking, achievement, and other types of behavior—all of which needs to be theoretically and empirically explored.

Applied Implications

An applied implication based on research findings (Stern, 1965, 1970) which have used the AI and the CCI is that liberal arts programs tend to serve as a model for schools striving for academic excellence. The press in the liberal arts college that stimulates excellence is one that tends to stress achievement and personal commitment. Most of all, this kind of college does not attempt to regulate the lives of its students. Students attending independent liberal arts colleges reflect characteristics consistent with the press. They tend to be socially, emotionally, and intellectually independent. In general, their interests are broad and they are highly motivated.

Other data can be interpreted as showing that the elite liberal arts colleges have made a staunch effort to reduce custodial personnel practices (Stern, 1970). The press in these colleges stresses student dignity. Students are encouraged to participate in the conduct and the administration of the academic affairs. Furthermore, CCI data indicate that the physical plant of the liberal arts colleges offers places and opportunities for student privatism. On the other hand, the denominational colleges and the large state universities tend to be more restrictive in the administration of student affairs. In these environments openmindedness and activity tend not to be stressed, and the administration has limited tolerance for student protests.

In regard to change, the implication of some research findings is that students seem to change relatively little as a function of the college experience. There are obvious differences among the programs offered by the small independent liberals arts college, the large university, and the denominational college. However, students who enter various programs at different institutions vary on many characteristics. Freshmen entering a denominational college are different from freshmen entering a business administration program at a large university. In addition, each group of freshmen at a given institution is similar to the upperclassmen in their own program or institution. Thus, Stern suggests that students tend to evidence little change as a result of the college experience. In fact, it is probable that students contribute to the maintenance of their own college culture.

Research on freshman expectations suggests that entering college students tend to expect high levels of activities relevant to both the academic and nonacademic spheres of life. They expect the environment to exhibit high academic standards coupled with opportunities for social participation and self-expression. They are enthusiastic but naive about the functions and goals of a college. In essence, incoming freshmen expect something very different from what the upperclassmen have reported they have actually experienced in the environment. The entering freshmen's composite expectations is in effect a myth, one that is indicative of the idealized institution of higher education in our society (Stern, 1970). Be this as it may, the reported expectations do reflect what freshmen college students think is going on in institutions of higher education (Stern, 1970). These self-reported thoughts and beliefs about the college environment would seem to be relevant and important information for college administrators, counselors, and faculties, particularly if we assume that thinking responses are related to overt behavior.

Another implication is that freshman expectations regarding self-expression may be associated with student protest activities. Data show that entering freshman students believe that their college expects them to develop a sense of social commitment and political individuality. Students believe that they are expected to develop new ideals and to act upon these ideals in real life. However, this quest for relevance is not reinforced or extended by faculty or upperclassmen. The dissonance stimulated by the discrepancy between expectations and reality might very well stimulate aggressive behavior.

In a counseling situation the AI and the CCI, the ECCI, the HSCI, and the OCI may be used to collect data and to develop hypotheses about the client. Six congruency models that have been identified by Stern (1970) would aid this diagnostic process. The first comparison focuses on differences between the client's AI pattern and the AI group pattern in a given environment. These discrepancies help identify differences between the client and his peers. Similarly, differences between the client's college expectations and group expectations on the CCI will tell the counselor something about the client's attitudes toward college in comparison with classmates. The third comparison explores the congruency between client needs (AI) and client expectations (CCI). Need-expectation dissonance may

stimulate dissatisfaction and possibly low achievement in the environment. The fourth model investigates need-expectation congruency for all students in the environment. Differences identified in this sort of analysis may support client differences or suggest potential adjustment problems. In the fifth model congruency between the client's needs and the group press (experienced) is studied. This comparison helps the counselor make a dissonance estimate concerning the client-environment fit. The final comparison is concerned with need-press congruency for all students. This comparison reflects the need-press congruency of the client's peers. Differences defined by this model may be consistent with client need-press discrepancies, or the differences may indicate realistic problems.

The need-press theory, then, does have certain practical implications. If future research clarifies, verifies, and extends the culture analysis approach, the theory should be of even greater applied value. Therefore, final judgment about the utility of the theory must be based on future empirical findings—as with all theory.

The final and most phenomenologically oriented theory of person-environment interaction is Pervin's transactional approach. Pervin's approach focuses on the discrepancies between the individual's perceived actual self and his or her perceived ideal-self. He hypothesizes that performance and satisfaction are associated with environments which tend to reduce the discrepancies between the individual's perceived actual self and his or her perceived ideal-self. Pervin in his work analyzes the person and the environment in terms of self-reported perceptions.

PERVIN'S TRANSACTIONAL APPROACH

Introduction

The most phenomenologically oriented theory of person-environment interaction, which will be referred to here as the transactional approach, has been developed by Lawrence Aaron Pervin. In operational terms, at least, Pervin (1968b) defines the individual and the environment by the individual's self-reported perceptions and his or her reactions to these perceptions. The approach attempts to focus on the transactions and interactions that occur between the individual and the environment. The use of his theory has not been great in the past few years. Nevertheless, the theory is an example of phenomenological commitment in the area of person-environment interaction and, therefore, worthy of consideration.

Pervin (1936-) received his bachelor's degree at Queens College in 1957 and his PhD in clinical psychology from Harvard University in 1962. He served as a consultant to the Catholic Welfare Bureau from 1963 to 1965. In 1964 he became an assistant professor of clinical psychology at Princeton University with an adjunct appointment in the University Health Services. Currently he is a professor of psychology at Rutgers University. His work has been primarily in the areas of individual-environment interaction and coping behavior of college students.

Background and Development

The theoretical rationale for Pervin's transactional approach is that human behavior can best be understood in terms of the interactions (cause-effect relationships) and transactions (reciprocal relationships) between the individual and his environment (Pervin, 1967b). To Pervin (1968b), for each individual there are interpersonal and noninterpersonal environments that tend to match or to fit the individual's personality characteristics. A match of individual to environment will probably contribute to a higher degree of performance and satisfaction. A low degree of fit will probably result in decreased performance and dissatisfaction.

Thus, Pervin maintains that performance and satisfaction may best be analyzed as a function of the interaction among individual, task, and situational or environmental variables.

The main thrust of Pervin's approach has focused on the way students as individuals perceive the environment and themselves. In order to investigate the student-college fit Pervin has used a semantic differential called the Transactional Analysis of Personality and Environment (TAPE) (Pervin & Rubin, 1967). On this instrument students are asked to rate themselves and such concepts as Self, College, Ideal-College, Faculty, Administration, and Students on the same scales. Discrepancies between ratings on pairs of concepts are then related to various criteria of performance or satisfaction with the college environment. In essence, the basic hypothesis of the approach is that individuals will evidence performance and more satisfaction in environments that tend to reduce the discrepancies between their perceived actual selves and their ideal-selves.

The Theory

Assumptions

The transactional approach is based on a cognitive balance orientation. The social-psychological theories that have been developed in this area make two assumptions about cognitive consistency or balance (Argyris, 1969). First, it is assumed that cognitive consistency permits individuals to predict more accurately and behave more effectively in their interactions with others. Second, it is assumed that there is a basic tendency for individuals to attempt to reduce imbalanced states such as cognitive dissonance and inconsistency; that is, there is a tendency for people essentially to dislike imbalance.

Pervin's approach focuses on the discrepancies between the individual's perceived actual self and his ideal-self. He hypothesizes that high performance and satisfaction are associated with environments which tend to reduce the discrepancies between the individual's perceived self and his perceived ideal-self. Three basic assumptions seem to underly the transactional approach (Pervin, 1968b). The first of these assumptions is that individuals find painful and unpleasant large discrepancies between their perceived actual selves and their perceived ideal-selves. The second assumption is that individuals are positively attracted toward objects in the perceived environment which hold potential for moving them toward their perceived ideal-selves; conversely, individuals are negatively disposed toward stimuli that hold potential for moving them away from their ideal-selves. The third assumption is that similarity in regard to objects of importance to the individual is desirable where the individual has a low actual self/ideal-self discrepancy and undesirable where the individual has a high actual self/ideal-self discrepancy. Drawing out the implications of this last assumption, it may be argued that emotionally "healthy" people tend to be more susceptible to growth (better choosers). This is so because a high actual self/ideal-self discrepancy

may stimulate distortion in perception of the importance of objects. Thus, objects perceived to be of value may serve to maintain or increase the actual self ideal-self discrepancy.

The important concepts of Pervin's theoretical approach have been operationally defined in a questionnaire called the Transactional Analysis of Personality and Environment (TAPE), which uses the semantic differential technique. Subjects are asked to rate their actual selves, their ideal-selves, and the college environment on various semantic differential scales. The direction and distance between the self and environment in relation to the ideal-self are then related to various environmental variables.

Transactional Analysis of Personality and Environment (TAPE)

The rationale for the development of the TAPE questionnaire is that human behavior can most effectively be understood in reference to the interactions and transactions between the individual and his environment (Pervin, 1967b). The TAPE questionnaire was developed by L. A. Pervin and D. B. Rubin. In this questionnaire, students are asked to rate a number of concepts on the same polar adjective scales. In its standard form TAPE requires that certain concepts (College, Self, Students, Faculty, Administration, and Ideal-College) be rated on 52 scales. Each scale consists of polar adjectives on an 11-point semantic differential. Concepts about college that are rated by the student refer to the particular college the student is attending. The student judges his own college on each of the 52 scales by circling 1 of the 11 numbers. Thus, the student indicates which adjectives he perceives to be the most descriptive of his college and the degree to which they are descriptive. The student's rating suggests his or her perception of his or her college.

Pervin and Rubin developed two forms (A and B) of the TAPE questionnaire. The forms consist of the same format but the content of the scales differ. The adjective sets used in these forms were originally developed a priori, based on dimensions which were thought to be relevant in measuring the relationship between the student and his college. Then, based on a 10-college pilot study, scales were selected that discriminated among colleges and between concepts. Some examples of the polar adjective sets are: religious-secular, artistic-pragmatic, conforming-rebellion, materialistic-idealistic, theoretical-practical. In its standard form the TAPE questionnaire includes an initial page on which students report biographical material (Pervin, 1967b). In the middle of the questionnaire the student responds to 16 questions about his satisfaction with the college environment. In the final section of the questionnaire students rate the concepts on the same polar adjective scales. Ratings are made on 11-point scales. Subjects are asked to decide which adjective most fits the concept being rated and then to report how strongly the adjective applies to the concept. The extremes of the 11-point scale are defined for the subjects. About 45 minutes is required for a student to respond to the TAPE.

R. A. Lilly (1965) completed a three-mode factor analysis (Levin, 1965) on the TAPE data for Form A and Form B. This analysis permitted an exploration of the factors on the scale, concept, and subject (college) variables. The factor analysis included 104 scales (52 scales on Form A and 52 scales on Form B), six concepts (College, Self, Students, Faculty, Administration, and Ideal-College), and 20 colleges. Fourteen scale factors, 3 concept factors and 3 college factors were derived from the analysis. The scale factors and sample scales are presented in Table 23 (Pervin, 1967b).

TAPE was developed in order to pursue interinstitutional research, intrainstitutional research, and the dynamics of student-college relationship. Interinstitutional research compares TAPE results among different college environments. Intrainstitutional research uses TAPE in an attempt to explore the sources of conflict within a college environment. Finally, student-college interaction research uses TAPE to explore individual performance and satisfaction as a function of the relationship between the individual and his environment.

Validity of TAPE

A study by Pervin (1967b) has explored the concurrent validity of TAPE using a sample of 3,016 students from 11 public and 10 private colleges. Form A of TAPE was used with 1,393 students from 11 public and 10 private colleges. Form B was used with 1,623 students from 11 public and 9 private colleges. Criteria for selecting and including a college in the sample were geographic location, size, male-female ratio, and campus atmosphere. Typically the students included in the study from a given college were enrolled in an introductory psychology course. Figure 8 (Pervin, 1967b) shows concept means for 3 colleges on two TAPE scales. These data suggest considerable variability in such ratings across concepts for a given college, across colleges in such ratings on a single concept, and in the pattern of ratings for a scale across the six concepts. Although these data are sparse, they do suggest that the scales and concepts of TAPE (Forms A and B) are able to discriminate within and among colleges.

Reliability of TAPE

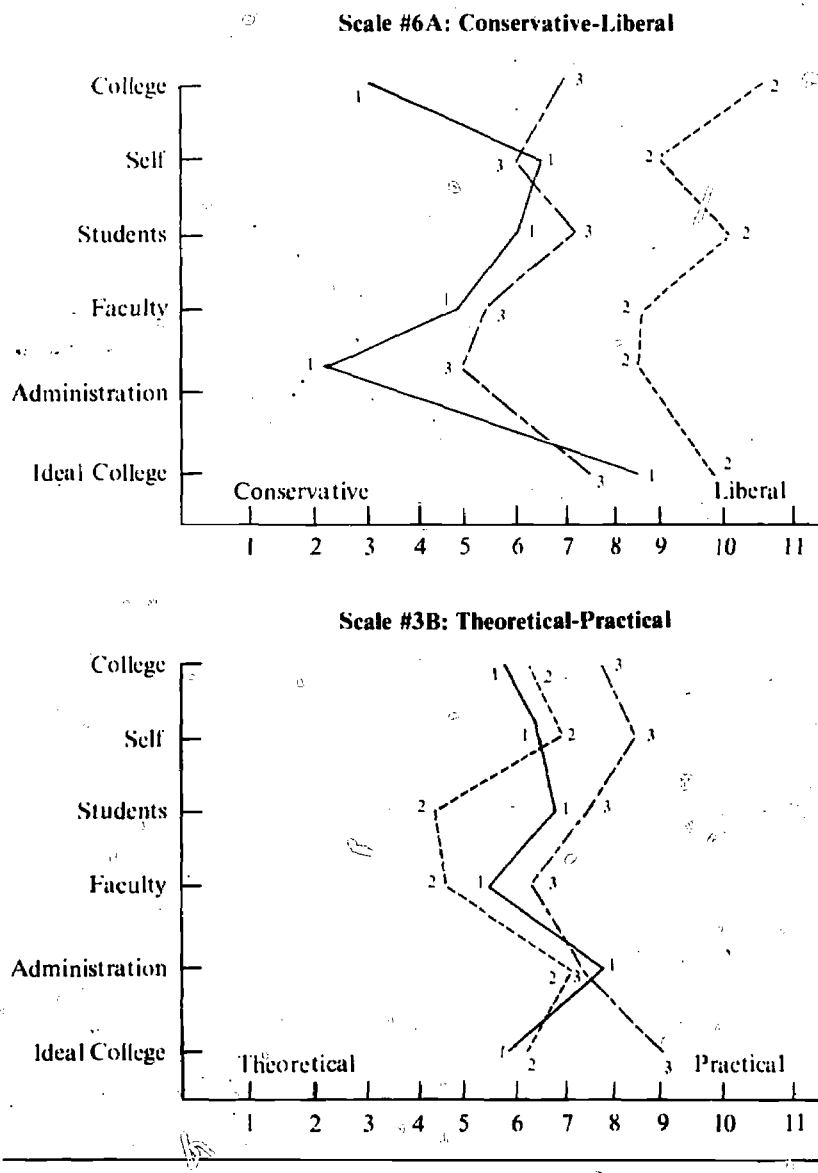
According to Pervin the reliability of TAPE is based upon past research on the semantic differential (Osgood, Suci, & Tannenbaum, 1957). Nevertheless, a test-retest reliability study with a one-month interval was completed on Form B by James Pedersen (as cited in Pervin, 1967b) of South Dakota State University. In the retest all students (N=75) rated the Self concept, but only half of the sample rated the Students concept. Table 24 shows the correlation coefficients indicating the reliability of TAPE (Form B) for three concepts (College, Self, and Students). The scale reliability (means for two samples and the means for test-retest) was found to be high, thus indicating an acceptable degree of scale stability. However, the individual subject reliabilities (mean), the 52 scale reliabilities (mean), and the

TABLE 23

Scale Factors and Sample Scales Derived from Three-Mode Factor Analysis

Factor	Sample scales
1. Impulsivity-Inhibition	1. sober-intoxicated disciplined-undisciplined
2. Humane idealism-Narcissism	2. humane-self-interested idealistic-materialistic
3. Warm-Cold	3. warm-cold sociable-unsociable
4. Introversion-Extroversion	4. introverted-extroverted eggheadish-well-rounded
5. Goal-directed activity	5. motivated-undirected industrious-tranquil
6. Liberal idealism-Conservative pragmatism	6. social welfare-laissez faire socialistic-capitalistic idealistic-materialistic
7. Scholarship	7. research-application scholarly-nonscholarly
8. Optimism-Alienation	8. relaxed-tense optimistic-pessimistic
9. Conventionality	9. religious-secular moral-amoral
10. Creativity	10. artistic-pragmatic esthetic-task-oriented
11. Sensitivity	11. feminine-masculine sensitive-insensitive
12. Tradition	12. upperclass- middle class elegant-common traditional-traditionless
13. Cosmopolitan-Provincial	13. cosmopolitan-provincial urban-rural

Source: L. A. Pervin, A twenty-college study of student x college interaction using TAPE (Transactional Analysis of Personality and Environment): Rationale, reliability, and validity, *Journal of Educational Psychology*, 58, 1967. (b)



Source: L. A. Pervin. A twenty-college study of student x college interaction using TAPE (Transactional Analysis of Personality and Environment): Rationale, reliability, and validity. *Journal of Educational Psychology*, 58, 1967. (b) Copyright 1967 by the American Psychological Association, and reproduced by permission.

Fig. 8. Concept means for three colleges on two TAPE scales.

concept reliability indicate a lower degree of stability. Of the concepts reported in Table 24, the Self concept appeared to be the most reliable for the types of reliability reported.

TABLE 24

Product-Moment Correlation Coefficients Indicating Reliability of TAPE Form B

Type of reliability	Concept		
	College	Self	Students
1. Mean of individual subject reliabilities	.59	.70	.58
2. Mean of 52 scale reliabilities	.40	.56	.47
3. Concept reliability—across scales + *Ss*	.58	.70	.60
4. Scale reliability—means for two samples	.98	.98	.98
5. Scale reliability—means for test-retest	.95	.99	.95

Note. For College, N = 37; for Self, N = 75; for Students, N = 35.

Source: L. A. Pervin, A twenty-college study of student x college interaction using TAPE (Transactional Analysis of Personality and Environment): Rationale, reliability, and validity, *Journal of Educational Psychology*, 58, 1967. (b) Copyright 1967 by the American Psychological Association, and reproduced by permission.

Another type of reliability check was performed by exploring the stability of individual discrepancy scores. The stability of a discrepancy score between two concepts on two different occasions was investigated. The test-retest product-moment correlation coefficients computed for Self/College and Self/Student discrepancy were .87 and .95 respectively. From these findings, the discrepancy scores show a respectable degree of stability.

Summary

Pervin's transactional approach, at least in operation, is perhaps the most extreme of the attempts to measure the environment as perceived by the individual. The approach is based on the rationale that behavior can best be understood in terms of the interactions and transactions between the individual and his environment. In general, this rationale stems from a cognitive balance orientation. Thus, it is hypothesized that individuals will tend to evidence higher performance, more satisfaction, and reduced dissonance in environments that function to reduce the discrepancies between the individual's perceived actual self and his perceived ideal-self. Ideally, the fit between the individual and the environment should not be exact but should present opportunities for change and personal growth. In order for college to be a developmental experience some discrepancies between the individual's perceived actual self and his ideal-self seem advantageous. To study the student-college fit, Pervin has used a semantic differential called the Transactional Analysis of Personality and Environment. TAPE requires students to rate six concepts on 52 scales. Pervin's approach, with its attendant instrument, may be used to pursue interinstitutional research, intrainstitutional research, and student-college interaction research.

Research

Research Directly Testing Theoretical Predictions

Person-environment congruency and satisfaction. Most of the work that has been concerned with testing theoretical predictions has focused on the congruency-satisfaction hypothesis. Three of the four studies conducted in this area tend to support the hypothesis.

Pervin (1967b) explored the congruency-satisfaction hypothesis by investigating the relationship between concept discrepancy scores and satisfaction ratings. A discrepancy score between two concepts was computed by adding the absolute difference in ratings for the two concepts on 52 scales. The findings showed that a high Self/College discrepancy score tended to be related to dissatisfaction and that this relationship was stronger for nonacademic dissatisfaction than for academic dissatisfaction. Further, Self/Student discrepancies were correlated with reports of dissatisfaction with the administration. The correlations were moderate, ranging from −.33 to .77. Nineteen of the median correlations fell in the 20's and 20 of the median correlations were in the .30's. In general, the relationships were relatively stable across Form A and Form B of TAPE.

A study by Pervin and Rubin (1967) predicted that discrepancies between the student's perception of self and his perception of the college environment would be related to his reported dissatisfaction with college. The sample consisted of 50 Princeton upperclassmen. All subjects responded to Forms A and B of TAPE. In this study only the College, Self, Students, and Ideal-College concepts were used. Subjects responded to Form A initially and to Form B about 2 days later. After responding to Form A the students answered questions concerning satisfaction with college. These questions inquired about the student's academic satisfaction, his nonacademic satisfaction, and the kinds of times he has had in college. The above questions were based on a semantic differential technique. In general, the findings supported the prediction. The results indicated that discrepancies between Self and College, Self and Students, and College and Ideal-College were significantly related to nonacademic dissatisfaction with college.

Pervin and Smith (1968) then attempted to test the individual-environment congruency and satisfaction hypothesis in other environments—in this case, eating clubs. The sample included 169 Princeton upperclassmen obtained from four eating clubs (social organizations similar to fraternities). Students rated the concepts of Self, Ideal-Self, and My Eating Club on a modified version of TAPE (Forms A and B). In addition, students were asked to report their perceived satisfactions with the club, the social life, interpersonal relationships, intellectual life, athletic life, kinds of times in the club, growth as a person, comfort in the club, and whether they would be happier in another club. Responses to these items were also made on a semantic differential. To test the congruency-satisfaction hypothesis, discrepancy scores (Self/Ideal-Self, Self/Club, and Ideal-Self/Club) were correlated with the satisfaction responses. Discrepancy scores were computed for each individual on each pair of concepts. The results supported the hypothesis that perceived person-environment congruency would be related to reported satisfaction for both forms of TAPE.

A limitation of this study of satisfaction with eating clubs is that discrepancies were summed across all 52 scales; thus, the direction of the difference in scale ratings was not considered. Ideally, an individual should tend to report satisfaction with an environment that is moving him or her toward his or her ideal-self. Therefore, the individual's perceived environment (college) should vary within the limits of the individual's perceived actual self (self-concept) and his reported Ideal-Self concept. Thus, both distance and direction of the Self, Ideal-Self, and College need to be considered.

Pervin (1967a) made an attempt to confront this problem of direction in one of his studies. Subjects for the study were 365 Princeton undergraduates (underclassmen and upperclassmen). Each subject rated the concepts of College, Self, and Ideal-Self on a modified version of TAPE (Forms A and B). Before rating the Ideal-Self subjects were asked to respond to five questions exploring satisfaction with the college environment. These questions focused on academic satisfaction,

nonacademic satisfaction, kinds of times enjoyed in college, frequency of thoughts about dropping out, and whether or not the student felt out of place at college. To explore the directional hypothesis, Pervin predicted that the college would be perceived as moving the individual toward his Ideal-Self if the college was rated between the Self and the Ideal-Self (S-C-IS). This state of affairs was viewed as desirable and satisfying for the student. However, it was thought that the college would be perceived as pulling the individual further from his Ideal-Self if the college was rated on one side of the Self and the Ideal-Self on the other side (C-S-IS). This situation was assumed to be undesirable. The findings showed that desirable relationships between scale values and satisfaction ratings were low and did not support the prediction. However, the undesirable relationships were consistent with the prediction.

Person-environment congruency and thoughts of dropping out. In one study, previously mentioned (Pervin & Rubin, 1967), it was hypothesized that the larger the discrepancy between a student's perception of self and his perception of college, the more likely the student would report a desire to drop out of college. Four questions were used to measure the student's reported probability of dropping out of college. These questions asked the student to report whether or not he thought he would drop out of college for academic (poor grades) or nonacademic reasons (personal reasons, transfer, etc.), and the frequency of these thoughts of dropping out of college. In general, the findings supported the prediction: discrepancies between Self and College, Self and Students, and College and Ideal-College were significantly related to reported thoughts of dropping out for nonacademic reasons.

Other Relevant Research

TAPE and social desirability. A study by Pervin and Lilly (1967) explored the relationship between social desirability and semantic differential ratings. Social desirability was defined as the need to obtain approval by responding in a culturally appropriate and acceptable manner (Crowne & Marlowe, 1960). The subjects included in the sample were 50 male and 50 female undergraduates. Subjects responded to a semantic differential by rating the concept My Self. The concept was rated on 13 scales (5 evaluation scales, 4 activity scales, and 4 potency scales). Next, subjects were asked to report the degree (4-point scale) of certainty of each scale rating. Then, the subjects rated the concept My Ideal-Self on the same 13 scales. Following this, the subjects reported the importance of each scale as a personality characteristic on a 4-point scale (very unimportant to very important). Finally, all subjects were asked to complete the Marlowe-Crowne Social Desirability Scale (SD).

In this study, the high SD scores were related to a tendency to judge oneself positively and to report few Self/Ideal-Self discrepancies. This finding was stronger for judgments on the evaluative factor than for judgments relevant to

activity and potency factors. Furthermore, high SD scores were found to be most strongly related to low Self-Ideal-Self discrepancies for the high certainty and the high importance ratings.

In general, the results suggested that ratings on the semantic differential can be influenced by a social desirability factor. The SD tendency did seem to become significant on adjectives or scales having a high evaluative loading (social-unsociable, good-bad, kind-cruel, unselfish-selfish, and wise-foolish). Also, from the results of this study, it seems that defensiveness may affect self and ideal-self judgments.

Summary

In general, the relevant data suggested limited support for the theoretical frame of reference of the transactional approach. The data provide some, albeit not total, confidence in the reliability and validity of the TAPE questionnaire in institutional research. Within certain limits, the results of the studies do suggest that TAPE is useful in the exploration and comparison of different college environments, in the analysis of sources of dissonance within a college environment, and in the analysis of satisfaction as a function of student-college interaction. Most of the research that has been conducted has focused on the congruency-satisfaction hypothesis; three of the four studies in this area lend support to the hypothesis. The congruency-achievement or performance hypothesis has not been empirically explored using the transactional concepts. Although additional research clearly needs to be completed in order to verify and to generalize the transactional approach, it is of interest to note that there have been no published studies using this approach after 1969.

Evaluation

Research on the transactional approach is obviously sparse. The findings that do exist generally support the congruency-satisfaction hypothesis. However, the congruency hypothesis has been studied with very few other variables. Additional research is clearly needed if the theory is to survive in its present form.

To date, all of the studies testing the theory have been conducted by Pervin and his associates on a homogeneous population (college students). High school students, those who do not attend college, faculty, administration, and college graduates have not been represented. Nor has the theory sampled older populations. Existing evidence does not indicate whether the theory is applicable to the large noncollege population.

Additional problems seem evident in Pervin's formulation. For instance, Pervin (1968b) assumes that individuals find large discrepancies between their perceived selves and ideal-selves to be painful. From this assumption, it is hypothesized that such discrepancies will be related to dissatisfaction and low performance. However,

it may be that some individuals are more tolerant than others of differences and are more flexible in coping with such differences (Pervin, 1967b). For example, an individual may be able to affect or redefine his environment in order to reduce his feelings of dissatisfaction and improve his overt performance. In general, neither the relevance nor the exact function of personality variables are treated in the transactional approach.

With respect to the overall status of the theory, how does the theory rate in terms of the criteria discussed in the first chapter? In regard to comprehensiveness, the approach has limitations. The processes underlying the development of the self concept and the ideal-self concept are not discussed. Furthermore, the environment is psychologically defined (by TAPE), but it is not defined in a physical sense. The assumptions and concepts that make up the theory are explicitly stated, albeit somewhat camouflaged in the earlier writings. The concepts of change and learning are not integrated components of the theory. Pervin does suggest that if college is to be a growth experience some person-environment incongruency seems advantageous in order to stimulate change. It makes sense that personal change must assume to some extent the acquisition (learning) of self-knowledge. On the other hand, attitudinal or behavioral change may not require conscious learning. In any event, Pervin does not operationally define the concepts of learning and change.

In general, the approach views human behavior within a transactional and an interactional framework. Pervin seems to use these two concepts interchangeably, if not ambiguously. The interactional framework suggests a cause and effect relationship among objects. The transactional framework involves objects relating to one another within a system. Pervin uses both terms in his work. Thus, the emphasis on the transactional framework does not necessarily eliminate the cause and effect relationship among objects. The theory does include empirical findings from related areas; research and relevant theory is included that focuses on performance and satisfaction as a function of the interaction between the individual and the environment (Pervin, 1968b). The theory needs improvement with respect to the parsimony of concepts introduced to account for performance and satisfaction behavior: the theory is perhaps too parsimonious. For example, as mentioned, the theory does not include the concepts of learning and change. The theory is more descriptive than explanatory. Little attempt is made to explain the origin of discrepancies between perceived selves and ideal-selves. Finally, the empirical research generated by the theory has not been extensive. Moreover, the extant findings are mixed, and suggest only limited heuristic value of the approach for intrainstitutional research and student-college interaction research.

Pervin's operational definition (TAPE) of the environment tends to vary from his conceptual plan. Pervin originally stated that for each individual there are environments (interpersonal and noninterpersonal) which tend to match or fit the individual's personality characteristics. This suggests that an interpersonal environment is defined in terms of the characteristics or perceptions of its members.

Thus, operationally the environment may be measured by taking a consensus or by aggregating self-reported perceptions. This method (as employed by Stern, 1970) seems to produce a reasonable estimate of the psychological interpersonal environment. However, Pervin operationally defines the environment in terms of each individual's self-reported perception. The environment is defined as it is individually perceived. No attempt is made to estimate the actual psychological environment by aggregating perceptions.

In his work, Pervin (1968b) refers to a noninterpersonal environment. This suggests a need for some measurement of the physical environment. It also suggests that the environment be defined independently of the individual's behavior. Yet, Pervin operationally defines the individual and the environment according to the individual's self-reported perceptions. He makes no attempt to measure the objective or physical environment. In short, it would appear that his actual operational definition of the environment varies from his conceptual analysis of it.

A wider base of data is needed before the adequacy and contribution of the theory can be satisfactorily judged. The transactional approach needs to be studied in college and noncollege populations. However, as mentioned, empirical research based on this theory has been nonexistent since about 1969.

Implications for Theory, Research, and Practice

Theoretical Implications

In one study, Pervin (1967a) explored the directional hypothesis that an environment which tends to reduce the discrepancies between the individual's actual self and his ideal-self will stimulate increased satisfaction and personality growth. He predicted that an individual would report satisfaction if the college was perceived as moving the student toward his ideal self. The results did not support the desirable relationships between scale values and satisfaction ratings. Generally speaking, students did not report satisfaction with an environment that they perceived as moving them closer to their ideal-self. On the other hand, the undesirable relationships were consistent with the prediction. Students did tend to report dissatisfaction with an environment that they perceived as not moving them toward their ideal-self. The theoretical implication that may be derived from this set of findings is that students may be more aware and sensitive to cognitive-inconsistency than they are cognitive consistency. People tend to dislike imbalance. Therefore, they may be more ready to express their dissatisfaction (in an attempt to influence the cognitive dissonance) than they are to report satisfaction with rewarding situations or events. In fact, it is possible that people may in general be more prone to express dissatisfaction than satisfaction. Thus, it might be argued that Pervin's basic prediction in the above study is inconsistent with the first assumption of his theory (that individuals find large discrepancies between their perceived actual selves and perceived ideal-selves to be painful). The above suggests

the opposite of Pervin's major prediction. A student is likely to report dissatisfaction with an environment that he perceives as not moving him toward his ideal-self (as the findings of the study corroborated).

Implications for Research

Although no research known to the author has been conducted during the past few years, Pervin (1967b) has suggested four potential areas in which the transactional approach might be implemented. Research on intrainstitutional variables would be meaningful. In this area investigators could study differences between males and females, members of different college years, place of residence, or members of the graduate school. Other problems in this area to be explored are related to the characteristics of colleges which stimulate large perceived discrepancies. A second research area of interest involves interinstitutional variables. Here the researcher might study such variables as size, complexity, type of college (public, private, and private denominational), and 2-year or 4-year colleges. For example, of clear empirical interest are the characteristics of heterogeneous colleges that might serve as a "buffer" for an individual, in that perceived discrepancies do not necessarily lead to dissatisfaction (Pervin, 1968a). Personality would appear to be another significant area for research. Individuals with different personality patterns probably cope with discrepancies between themselves and their environment in different ways. Research in this area might investigate the differences between regular and experimental college programs and between students who are members of protest groups and those who are not. Finally, of significance too, is methodological research pertaining to instruments in conjunction with the theory. Future work in this area might analyze individual scale scores, factor scores, and the direction and distance of perceived discrepancies.

Applied Implications

Pervin suggests that a student may tend to be more satisfied and productive in a college that does not offer him an exact fit. A somewhat imperfect match presents opportunities for change. TAPE may be used in estimating the student-college fit or the degree of mis-fit, as it were. But in using such estimations, the counselor must be willing to place slightly rounded pegs in slightly squared holes, and hope they eventually come to better fit each other. In using TAPE the distance and the direction of differences in ratings could be of significance. It might turn out that the distance and the direction of differences for optimum growth and change vary from one individual to another; if so, this would make the prediction task difficult, to say the least. However, it is possible that meaningful *ranges* of distance could be established, and used to determine a reasonable match between the student and the college.

In terms of diagnosis in counseling, TAPE might be used to identify a concept discrepancy (Self, Students, Self, Faculty, Self, Administration, Self, College, Self, Ideal-College, and Self, Ideal-Self), which in turn might suggest an area of personal difficulty. A goal in the counseling process might then involve some type

of thought or behavioral modification aimed at reducing dissonance and hopefully to improving satisfaction and performance. The task would be one of either changing the individual or his environment in order to reduce the existing strain or dissonance. Another alternative, of course, would be to move the individual to a different more compatible environment.

In general, the theory does not suggest techniques for counselors beyond the notion that experiences should be developed or scheduled that facilitate personal growth and development. However, Pervin does not offer an analysis of exactly what is meant by "personal growth" or "development." Nor does Pervin suggest a means by which one determines whether such personal progress is taking place, if at all. Still in all, the theory might be useful in at least helping a counselor to identify some of the *potential problems* that might confront students during certain stages of their development during college. The identification of these potential problems might aid the counselor in the development of preventive techniques as well as in combating the problems when they appear. Given the significance of this area, it is disappointing that Pervin did not broach the analysis of developmental stages.

The seventh and final chapter of this monograph will attempt to compare the theories on a number of substantive attributes and in terms of the formal adequacy of each theory.

A COMPARISON OF THE THEORIES

In this monograph five major theoretical viewpoints toward the dynamics underlying the relation between the individual and his environment have been reviewed in considerable detail. In general, Lewin's dictum that "behavior is a function of personality and environment" appears to be a basic assumption of all five viewpoints. Having evaluated the theories, described relevant research, and discussed pertinent implications, it would now seem appropriate to analyze certain similarities among the theories (that do exist along with the differences that distinguish them). The theories will initially be compared with respect to how well each meets the overall criterion of substantive generality. In a later section of this chapter the formal adequacy of each theory will be treated. At that point, particular emphasis will be on how well each theory has generated research. In terms of evaluation, this criterion furnishes one of the most telling comparisons that can be made among theories.

A Comparison of Substantive Attributes

In this section, the focus is upon similarities and differences in *content* of the theories rather than in their *form*. The theories are to be compared in their treatment of the following aspects: heredity, early experience, purpose, reward, development, concept of the person, measurement of the person, concept of the environment, measurement of the environment, the person-environment relationship, the outcomes for the individual, and the interdisciplinary anchoring.

Heredity

The part heredity factors play in determining behavior is not really emphasized by any of the theorists herein discussed. Holland does mention that an individual's personality type is the product of the interaction between his heredity, cultural and personal forces, and the physical environment. Also, in Murray's (1957) need-press theory, which forms the basis for Stern's work, a distinction is made between types of needs. The primary needs are linked to characteristic organic events and typically refer to physical satisfactions. The secondary needs (achievement, exhibition, dominance, etc.) are presumably derived from the primary needs and are not

directly connected with any specific organic processes or physical satisfactions. The remaining theorists (Pervin, Barker, Newcomb, Clark & Trow) place little emphasis on this area. Most generally, hereditary factors tend not to be emphasized in either theory or the research of these theorists.

Early Experience

Another area in which the theories vary is the analysis of the importance of early developmental experiences compared with later experiences. Put in somewhat oversimplified terms, the question is whether the theory assigns more importance to experiences taking place in childhood than to experiences taking place at later stages of development. Holland emphasizes (and empirically explores) the impact on the development of a personality type of childhood experiences with parents and social pressures in early adolescence. Stern does not discuss early experience. However, Murray (1957) upon whose theory Stern based much of his own work suggests that the history of the organism is the organism. The individual is a composite of his past experiences. The other theorists (Pervin, Barker, Newcomb, Clark & Trow) tend to place little explicit emphasis upon early experience. Rather, they seem to emphasize the importance of understanding the present. According to Hall and Lindzey (1957) there is a tendency for theorists who emphasize the importance of the environment to minimize the importance of events taking place early in development as well as hereditary factors. In this regard, Barker in particular seems to be more interested in what is "out there" (in the environment) rather than what might be said to "inhere" in the individual.

Purpose of Man

The significance of man as a goal-striving and purpose-oriented creature is accepted by most theorists. To Holland, people search for environments consistent with their personality type. Pervin suggests that there is a basic tendency for people to move toward a state of cognitive consistency. The Stern model views individuals as interacting with various environments according to the degree to which these environments gratify or frustrate their needs. Barker in his theory suggests that people function to maintain behavior settings. Finally, the subcultural approaches implicitly suggest that people seek out environments which tend to be consistent with their personal characteristics and traits.

Reinforcement

The relative importance of reward or reinforcement as a determinant of behavior is emphasized in only certain of the theories. In its contemporary form, the so-called law of effect states that only those responses that are accompanied by a reward or pleasure will be retained or learned. Murray and Stern perceive the individual as

interacting with environments according to the degree to which they gratify or frustrate his needs. Holland in his work suggests that congruent person-environment relationships stimulate satisfaction, achievement and personal stability. Barker indicates that people function to maintain behavior settings in order that they may continue to derive the satisfactions of these settings. Pervin emphasizes that imbalance, incongruity, and dissonance are painful states; essentially, there is a tendency for people to want to avoid that which is not rewarding. In general, then, these theorists tend to include reward or reinforcement (implicitly if not always explicitly) as a determinant of behavior. Even among the subculture models, some research conducted by Newcomb suggests that members of specific subcultures may tend to maintain — that is, reinforce — existing attitudes and behaviors.

The Developmental Process

The focus on the learning process by the theorists under consideration is limited. Most of them have been content to view development in terms of general principles such as maturation, self-actualization, or growth rather than attempting to provide a detailed picture of the learning process itself. Pervin suggests that a certain degree of person-environment incongruency is desirable, so that growth and change might be stimulated. Stern indicates that some need-press patterns may tend to stimulate self-enhancement and self-actualization. Holland, albeit with limited success, has empirically explored the hypothesis that parental attitude factors are a major influence on the pattern of personal orientations that an individual develops. Barker, as part of his behavior-setting theory, indicates that the characteristics of settings are not only perceived but also suggest certain kinds of behavior to participants. Theories based on the importance of subcultures imply that the attitudes and values held by members are learned in the particular subcultural environment; thus, the subculture has an impact on its members. Even given these considerations, it must be concluded that the analysis by these theorists of the learning process, individual change, and/or development is sketchy.

Concept of the Person

The theories vary considerably in their conceptualization of the person. Two of the theories have no theoretical concept of the person, and although Barker theoretically maintains that both the individual and the environment must be taken into account in predicting behavior, his work emphasizes only the environmental component (and the impact of the environment upon behavior). The subcultural approaches have no stated concept of the person; the emphasis is upon describing the environment and the impact of the environment upon its members. Holland, to the contrary, does offer an explicit concept of the person in his work: he analyzes the person in terms of personality types (clusters of traits). These types, it is argued, represent common outcomes of growing up in our culture; an individual acquires certain preferences and interests as he develops, and these reflect his personality. Stern's theory conceptualizes the person in terms of his

social needs. A need state is characterized by the tendency to want to perform actions of a certain kind. Man consists of a pattern of needs, for each of which he seeks satisfaction and gratification. Pervin's concept of the person is more phenomenological in nature than are the others. He views the person in terms of the person's picture of himself — that is, his self-concept. Moreover, reality "is" as man *perceives* it to be.

Measurement of the Person

The theories use different methods to operationalize their concepts of the person. Barker, as previously noted, has no concept or operational definition of the person. At least theoretically, however, he does assert that the individual and the environment should be measured independently. Similarly, the subculture approaches have no explicit concept or operational definition of the person. Implicitly, however, these approaches do suggest that the person may be defined or described in terms of common group characteristics. That is, common group attitudes and characteristics are informative about the individual members of the group. In Holland's theory, man is operationally defined by his responses to the Vocational Preference Inventory (VPI) and the Self-Directed Search (SDS). Holland scales operationalizing the personality types have also been derived from items on the Strong Vocational Interest Blank. Holland argues that vocational interests and preferences are in effect an expression of personality. He thus uses self-reported vocational interests (assessed by the VPI) to identify personality orientation (or the person). The SDS completes a more comprehensive assessment compared to the VPI. This instrument (the SDS) uses self-reported activities, competencies, vocational preferences, and self-estimates to identify personality orientation. In Stern's theory, the person is operationalized by means of his responses on the Activities Index (AI). The basic assumption underlying the Index is that needs are reflected in self-reported behavior (self-reported interests in specific activities). These self-reported preferences are assumed to be useful estimates of actual behavior. Finally, Pervin in his work operationally defines the person in terms of his self-reported self-concept, as gathered by the Transactional Analysis of Personality and Environment (TAPE); essentially then, the individual is defined in terms of his own perceptions about himself.

Concept of the Environment

Each of the theories has developed some concept of the environment. These conceptions vary on a continuum defined basically in terms of phenomenology. The least phenomenologically oriented of these theories have attempted to look at the environment more "objectively." Thus Barker, in his work, places primary emphasis on the actual environment and tends to neglect the individual. He conceptualizes the environment in terms of behavior setting—a standing pattern of behavior or a related cluster of behavior-milieu parts. Behavior settings tend to select and shape the behavior of people who inhabit them. Similar to behavior-

setting theory, the subcultural approaches place major emphasis on the environment. The Clark-Trow model explicitly conceptualizes the environment in terms of subcultures, the basic theoretical assumption being that individuals associated with a subculture interact and evidence common characteristics and behaviors. The Newcomb model initially defined the environment in terms of type (members' common characteristics) and later in terms of subculture. Applying the terms of Barker's frame of reference to the subcultural approaches, it may be suggested that a subculture implicitly is a large behavior setting (or a cluster of behavior settings inhabited by many of the same people). Whether or not this application is totally correct, it is true that the subcultural approaches, like behavior-setting theory, propose that the environment (in this case, the subculture) does influence the behavior of its members. Holland's concept of the environment is inherent in his formulation of model environments. He defines environmental models in terms of the situation or atmosphere created by the people who dominate a given environment; that is, the dominant features of an environment are dependent on the typical characteristics of its members. Put simply, people tend to make the environment. Stern's concept of the environment is much more phenomenological than the theories discussed to this point. He conceptualizes the environment in terms of perceived press (private and consensual). The private press refers to the unique and private view each person has of the events in which he takes part. The consensual press is characterized by common and shared perceptions of the environment. Thus, the consensual environment seems to be more important in Stern's theoretical frame of reference than is the private press. Pervin also conceptualizes the environment in terms of perceptions. He suggests that an interpersonal environment should be defined in terms of the perceptions of its members. The noninterpersonal environment, to which he alludes, is not discussed conceptually or operationally. Theoretically, however, he does feel it important to conceptualize environment independently of behavior.

Measurement of the Environment

The measurement devices and techniques used to operationalize the various environmental concepts vary considerably. Barker probably has what might be called the most objective definition of the environment. He operationally defines and describes behavior settings using the Behavior Setting Survey (BSS). Before an attempt is made to explore the impact of a setting upon its members, the setting itself is first identified and described. Barker primarily uses behavior units to analyze the effects of the environment on the individual. He makes no attempt to measure the environment as it is perceived by its members. In the Clark-Trow approach, environments (subcultures) have usually been identified by means of the College Student Questionnaire (CSQ) (although equivalent devices are suitable). In the Newcomb model, as put into practice, observers have assigned students to the different orientations. The environments (subcultures and orientations) are then described in terms of the characteristics of their members. This is accomplished by taking a census of the self-reported attitudes, values, behaviors, and roles of people

either endorsing or assigned to a given orientation. Again, no direct attempt is made to measure the environment as it is perceived by its members. For Holland, the dominant features of an environment depend upon the typical characteristic of its members. To operationally define the environmental models, the Environmental Assessment Technique (EAT) was developed. Although this measurement technique entails a census of self-reported preferences of the members of a population, reactive data are not collected. EAT simply takes a census of nonreactive data. Thus, the perceived environment is once again ignored. Stern, however, does place major emphasis on the phenomenological environment. In his theory, the environment is operationalized by means of four indexes (College Characteristics Index, High School Characteristics Index, Evening College Characteristics Index, and the Organizational Climate Index). The basic assumption behind the indexes is that the environment may be defined in terms of press, which are inferred from self-reported behavioral perceptions. It is possible that the aggregate environment phenomenologically may be the "best estimate of the environment that can be made." In using the Transactional Analysis of Personality and Environment (TAPE), Pervin clearly operationally defines the environment in terms of self-reported perceptions. The environment is defined phenomenologically, as it is individually perceived. No attempt is made to aggregate perceptions. The TAPE data provide specific, individual reactions.

The Person-Environment Relationship and the Outcome for the Individual

To some extent all of the theories reviewed focus on behavior as a function of the individual and the environment. However, they do have different ways of conceptualizing the person-environment relationship and the consequent outcomes for the individual. As previously mentioned, in Barker's theory both the individual and the environment are to be taken into account in predicting behavior. However, his actual work emphasizes the environmental component and the effect of the environment upon behavior. More specifically, his suggestion (supported by research) is that an association exists between the number of people in a behavior setting and the frequency and intensity of certain behaviors emitted by the people in the setting. For example, research indicates that people in undermanned behavior settings tend to be busier, more vigorous, more versatile, and more involved in the setting; and in general they seem to be personally more productive and more satisfied.

The subculture models tend to describe the environment in terms of the attitudes, values, behaviors, and roles of its members. Thus, similar to behavior-setting theory, these approaches emphasize the environmental component and its effect upon behavior. An implicit assumption about the person-environment relationship seems to be that people tend to enter and participate in environments consistent with their personal characteristics. However, there is little evidence at the moment that people with similar characteristics are aware of their common orientation and actually form a subculture by interacting with one another. One study, done within the Newcomb frame of reference, was able to show that members of a certain (social) type did tend to enter environments consistent with their orientation.

Moreover the findings suggested that the group members chose to live together and interact with one another. Implicitly these results suggest that consistent person-environment relationships may tend to stimulate interpersonal satisfaction as well as the maintenance and reinforcement of certain attitudes and behaviors.

Holland views behavior as a function of the person and the environment, although he primarily seems to emphasize the person and not the environment in this formulation. Holland believes that congruent person-environment relationships (an Investigative personality type in an Investigative environment) lead to predictable and understandable individual outcomes. Research findings indicate that not only do individuals tend to choose environments consistent with their personal orientations, but that congruent person-environment interactions are associated with reported personal and vocational stability and satisfaction.

The basic assumption of Stern's theory is that behavior is a function of the transactional relationships between the individual (needs) and the environment (press). Stern, like Holland, stresses the significance of the individual; he operationally defines the individual and the environment in terms of self-reported behavior. In his exploration of the person-environment relationship, Stern makes use of a congruence-dissonance dimension and an anabolic-catabolic dimension. As an important hypothesis of his theory, a relatively congruent person-environment relationship (combination of needs and press) produces a sense of satisfaction or fulfillment for the individual; conversely, a relatively dissonant person-environment relationship (unstable needs-press combination) produces stress for the individual. Further, a need-press pattern or relationship that is anabolic in nature is hypothesized to be stimulating for self-enhancement and self-actualization; conversely, a need-press pattern that is primarily catabolic is predicted to hinder personal development. It should be noted that the research evidence does not support these hypotheses. The few need-press congruency studies predicting achievement and satisfaction are not encouraging; the findings suggest that satisfaction and achievement behavior are not functionally related to the person and the environment. However, the most recent research across colleges does suggest a certain degree of congruency between the average level of student needs and environmental press. The relationships that have been found indicate both the kind of academic environment in which a given need is maximized and the types of students to be found in any given environment. Moreover, the need-press combinations seem to constitute different college cultures. Thus far, however, no research has explored need-press congruency *within* a culture and the consequent outcomes for the individual.

The basic rationale of Pervin's phenomenologically oriented theory is that behavior can best be understood in terms of the interactions and transactions between the individual and the environment. He operationally defines both the individual and the environment by the individual's self-reported perceptions and his reactions to these perceptions. He maintains that for each individual there are environments that tend to match the individual's perceptions of himself. Thus, it is hypothesized

that self-environment similarity (compared to self-environment dissimilarity) tends to stimulate (self-reported) higher performance and greater satisfaction. Some of the research in this area does support the congruency satisfaction hypothesis. But other research exploring the hypothesis that individuals will report more satisfaction in environments that function to reduce the discrepancy between the perceived self and the perceived ideal-self has not been supportive.

Interdisciplinary Anchoring

A final question of interest (when comparing the substantive attributes of the theories) is the extent to which each theorist attempts to relate his theory and findings to other disciplines. The theories may thus be compared with respect to the nature and degree of their interdisciplinary anchoring (to use Hall and Lindzey's term). Holland has analyzed behavior primarily within a psychological model of theory and research. Pervin's basic assumption of the painfulness of imbalance, incongruity, and dissonance suggests a conceptual model anchored in social psychology. Stern has based his theory on the work of Lewin and Murray which seems to be oriented toward the disciplines of anthropology and sociology. However, his operational definitions of the basic concepts drawn from these earlier theories are mainly psychological in nature and implication. As part of his focus on ecological psychology, Barker seems oriented toward linking his formulations with the disciplines of anthropology and sociology. His naturalistic research model especially suggests this particular interdisciplinary anchoring. The remaining theorists (Newcomb, Clark & Trow) connect their formulations primarily to the discipline of sociology (with an emphasis on the determinant of group membership). In general, it may be seen that the theorists as a group are oriented toward the social sciences. Such anchoring certainly seems to be consistent with the emphasis placed on the environment within which the behavior occurs.

The discussion to this point has been intentionally broad, in the sense that the emphasis has been upon the overall status of person-environment interaction theory rather than on a detailed comparison of specific theories. The information given in Table 25 attempts greater comparative specificity about each of the substantive aspects discussed in this section. Because the theories are complex, it cannot be known with certainty how to classify exactly each theory on each "dimension." Therefore, the judgments made in Table 25 should be viewed as only approximate.

A Comparison of Formal Attributes

This section focuses upon differences in form of the theories, with particular emphasis on the heuristic value of each theory. The concern is with the adequacy of the development and presentation of each theory's structure. Generally speaking, each theory has difficulty adequately meeting any of the heretofore designated standards for formal theoretical attributes. In one way or another, all are in need of improvement before they can be considered to be even minimally adequate

TABLE 25

Comparison of the Theories on Different Dimensions

	Heredity	Early Experience	Purpose	Reward	Development	Concept of Man	Measurement of Man	Concept of the Environment	Measurement of the Environment	Person-Environment Relationship	Interdisciplinary Anchoring
Barker	L	L	M	M	L	L	L	H	H	L	M
Newcomb, Clark & Trow	L	L	L	M	L	L	L	H	H	M	M
Holland	M	H	H	M	M	H	H	M	M	H	L
Stern	M	M	H	M	L	H	H	M	H	M	M
Pervin	L	L	H	M	L	H	H	M	M	H	L

H = High (emphasized)
M = Moderate
L = Low (not emphasized)

across the full array of formal criteria: comprehensiveness, clarity and explicitness, operational adequacy, inclusion of known empirical findings, parsimony, and empirical research generated.

Comprehensiveness

An effective theory should be comprehensive. It should not only generate predictions that are related to the empirical data upon which the theory focuses, but also make predictions concerning a wide range of human behavior. Barker's theory has focused primarily on population size in making inferences from behavior settings to behavior of their inhabitants, and vice versa. The base of this theory should be broadened by exploring other variables such as personality, motives, etc. Holland's theory, too, has limitations that restrict its comprehensiveness. Holland himself asserts that he has neglected the economic and sociological influences upon behavior in his theory. Furthermore, the theory explains very little about the process of personality development. Another limitation is the unknown degree of the theory's applicability to women and older people. Evidence relevant to Stern's theory suggests that behavior is not necessarily a function of only needs and press. Moreover, this particular theory presents little information about the processes of need development. Pervin's work has not at this moment been generalized to the noncollege population. Nor has Pervin discussed the processes underlying the development of the self concept and the ideal-self concept. The subcultural approaches generally seem to be restrictive in nature. Each model is based on only two dichotomized dimensions. Other variables may be just as relevant. Also, these models are not informative about the developmental process of group or subculture orientations. In short, all the theories need to be improved with respect to comprehensiveness.

Clarity and Explicitness

Another attribute of a sound theory is clarity, precision, and explicitness of its assumptions and concepts. The theories developed by Holland and Barker clearly and explicitly state theoretical assumptions and concepts. Holland assumes that interests are a reflection of personality. Evidence suggests that vocational preferences, expressed interests, and personality all relate to one another, but the intercorrelations are modest. In Barker's theory the basic assumptions are both logical and understandable, but their elaboration is amazingly complex. The theories elaborated by Stern, Pervin, Newcomb, Clark and Trow are in need of improvement with respect to clarity and explicitness. One of the basic assumptions of Stern's theory is stated clearly and explicitly, but two are only implied (and then only in earlier work). Likewise the basic assumptions of Pervin's theory tend to be camouflaged in early writings. In the subcultural models logical, consistent, explicit assumptions are not stated (although one assumption is implied). Each model is based on two dimensions - for the most part lucidly presented - which are dichotomized and used to approximate student groups or subcultures.

Operational Adequacy

Adequacy in terms of the reliability and validity of the measures operationalizing the concepts of the various theories is certainly a criterion of importance. Evidence indicates that Holland's one operational definition (VPI) of the person is reliable and valid, and thus may be effectively used in research and counseling. In addition, certain of the reliability and validity data of the VPI can be generalized to the SDS; but the reliability and validity of SDS still needs to be independently established. The Holland scales, developed from SVIB items, have some degree of concurrent validity, but additional work is again needed. To measure an individual's needs, Stern developed the AI. The results of a number of studies that have explored the validity and the reliability of this instrument suggest that the measure is operationally adequate for use in counseling and research. Extant research supports the meanings attributed to the scales. Pervin has operationalized his concept of the person using TAPE. The few available validity studies suggest that this instrument should probably be used only for exploratory research purposes. Of the several TAPE concepts studied, the measure of self concept seems to be the most reliable.

The operational adequacy of the environmental measures also varies across the theories. Barker developed the BSS to operationalize his concept of the environment. This survey seems to be one of the objective methods for measuring and describing the environment. Reliability (independent judges' ratings) has been explored for some of the BSS variables, and the findings indicate acceptably high agreement between independent judges' ratings. However, the reliability of other BSS variables still needs to be studied, and no validity (accuracy) studies have been reported. Barker suggests that the accuracy or validity of obtained information is important and may be improved by checking clerical work, obtaining information from more than one informant, and by cross-checking findings with other variables. In essence, the BSS seems to be a useful means of identifying and describing behavior settings even though additional reliability and validity (accuracy) data are needed. The Clark and Trow subcultures are usually operationalized by four descriptions in the CSQ. The studies of concurrent validity suggest that a number of variables discriminate among the students associated with the different subcultures. Reliability studies are few, but the existing data do show a certain consistency in choice of subculture over time. The CSQ descriptions thus seem useful for identifying self-reported subculture association, but only for the four defined subcultures. Therefore, the operational adequacy of the descriptions is in effect limited by the model itself. However, and partially counterbalancing to this limitation, the descriptions are clear (simple) and easily lend themselves to research. In Holland's theory, the environment is operationalized using the EAT. This instrument takes a census of the kinds of people found in an environment. The technique simply involves a counting of self-reported preferences. Empirical evidence suggests that this method of describing college environments possesses moderate validity and acceptable reliability. Stern has operationalized the concept of environmental press by means of the CCI, the

HSCI, the OCI, and the ECCI. The basic rationale behind the indexes is that presses can be measured by consensual or aggregated perceptions of environmental activities. Data tend to support the reliability and validity of the CCI, and thus this index seems to be operationally adequate for research and practice. The other three indexes need further study. In Pervin's work TAPE is used to operationalize man and his environment. The assessment is phenomenological in nature: each individual reports his perception of the environment, and thus the environment is defined as it is individually perceived. The small amount of existing validity data suggest that the individual scales and concepts are able to discriminate within and between colleges. Reliability coefficients for the concepts of college and students are acceptable but not high. It is evident that additional reliability and validity work should be performed in order that the practical and research value of this instrument may be more fully evaluated.

Inclusion of Empirical Findings

All of the theories to some extent include and organize known empirical findings within their framework. Barker's work seems to meet the criterion of doing so most effectively. He has included within his frame of reference relevant evidence drawn from organizational settings' work environments, community settings, high school settings, and college environments. Stern in his theory has included evidence drawn from the area of personality, i.e., behavior is a function of the individual's needs and the environmental pressures. Pervin, working within a cognitive framework, includes evidence that treats performance and satisfaction as a function of the interaction between the characteristics of the individual and those of the interpersonal and noninterpersonal environment. Holland's theoretical stance is to some extent sponsored by the empirical findings in the areas of vocational interests and personality. Finally, to date, the extent to which the subcultural approaches have included known relevant findings is disappointing.

Parsimony

Another relevant criterion of a sound theory is parsimony. A theory which is parsimonious is one that is communicable and understandable to those who read it. Holland's theory seems to be adequate on the grounds of parsimony of concepts introduced to explain behavior. And, in general, his theory rates relatively high on communicability. He has built this theory on only two major concepts (personality types and environmental models). Similarly, Stern uses only two major concepts (need-press concepts). However, as previously noted, two of the theoretical assumptions associated with these concepts are not stated. In Pervin's work the concepts are simple, but the basic assumptions are not clearly stated. For most, Barker's theory will be very difficult to understand due to the formidability of the concepts and the attendant detail. In the subcultural approaches the dimensions are clear and understandable, although perhaps overly simplistic. It might be said that these subcultural approaches are in a sense too parsimonious.

Empirical Research Generated

We have now arrived at the most significant evaluative comparison that can be made among theories: how effectively do the various theories function as generators of research? If a theory can be shown to have had a "generative effect" upon relevant areas of research it has passed the most crucial of tests. Thus, the consideration that takes precedence over all others with respect to formal adequacy of a theory is the amount of research it has produced.

Considering Barker's work, it is clear that his theory has led to significant research which has been carried out in a variety of areas by a diverse group of investigators. His theory has been applied in organizational settings, work situations, group meetings, community settings, and high school and college settings. Most of this research has focused on the effects of setting size upon the behavior of individuals. An attempt has been made in this book to thoroughly review the existing research. Other sources documenting the research in this area are Indik (1963), Willems (1964), and Barker (1968). Barker's theory and research methodology not only have had an impact on psychological research, but also have had considerable impact upon anthropological and sociological investigation.

Stern's "need x press = culture" theory has also led to a fairly large quantity of research dealing with a broad range of topics. The research issues related to the theory have been explored in a variety of different settings (high school, college, junior college, industrial, and Peace Corps) by a number of individuals. This research is thoroughly documented in a recent book by Stern (1970). Generally speaking, the theory has indeed stimulated research, but much of the research has focused on the measurement of needs independent of press (or the measurement of press independent of needs). Research on the need-press theory proper is sparse.

The quantity of the research pertinent to Holland's theory is increasing rapidly. To date, over 60 studies have been carried out using the concepts and operational definitions of Holland's theory. The growing interest in the theory has probably been stimulated to some extent by the newly developed operational definitions. The Holland personality types may now be operationalized by the Vocational Preference Inventory, the Self-Directed Search, and by items in the Strong Vocational Interest Blank. Another reason for this interest in Holland's theory may be that the concepts and operational definitions of the theory are easily converted into research terms. A previous limitation of the research on the theory had been that much of the work was conducted by Holland and his colleagues on atypical samples (exceptionally talented high school and college students). However, over the past few years a number of studies have productively used samples of typical college students and typical high school students. A few studies (Lacey, 1971; Parsons, 1971) have successfully applied Holland's theory in actual work environments. As the quantity and scope of the research on Holland's theory thus

augments, a wider data base with which to more fully evaluate the theory will be generated.

Pervin's theory has been accompanied by little research. In fact, the theory in effect has been empirically dormant since about 1969. Moreover, the research that has been done has only dealt with a limited range of theoretical and research problems. All of the studies testing the theory have been conducted by Pervin and his associates on a particular homogeneous population (college students). The existing research is primarily concerned with the self-environment similarity and satisfaction hypothesis. More than this research is needed if the theory is to have a meaningful impact on the study of behavior as a function of the individual and his environment.

Some research has been conducted on the subcultural models, but it has been restrictive in scope. For the most part, only the college setting has been used as a site for research. The main purpose of the research has been to describe the subcultures in terms of common student attitudes, interests, and behaviors rather than in terms of communicative sharing and actual interaction of students. Thus, almost none of the research (Newcomb's work is an exception) has clearly indicated that interactional subcultures exist. The existing research does not test the models. However, the Clark-Trow model has served as a basis for the development of other models, and it has stimulated research. But more research similar in nature to that of the Newcomb study will have to be done if these models are to have a continued impact on the field.

In spite of certain limitations of each theory as a generator of research, it is true that all of the theories have been accompanied by some research. Many of the investigations have procedural difficulties, but the fact remains that, to a varying degree, the effectiveness of each theory indeed has been empirically examined.

The theories are more adequate when their research applications are stressed than when they are examined for counseling applications. The concepts of the theories by Holland and Stern seem to be the easiest to convert into research terms. The concepts of these theories are close to the descriptive level of behavior and, therefore, are probably more easily translated into research terms. The relationships between individual-environment congruency (need-press or personality type-model environment) and other variables (achievement, satisfaction, and personal stability) can be observed and related to each theory. The theory by Barker is not as easy to translate into research terms even though the theory is primarily concerned with overt behaviors: the theory is operationalized by the Behavior Setting Survey, and although this survey is methodologically adequate, the process involved in actual data collection is elaborate and complex. The remaining theories (Pervin, Newcomb, Clark & Trow) are not especially difficult to implement in research terms, but there is some question about their operational adequacy.

As with the first section of this chapter the discussion in this section has been

TABLE 26

Comparison of the Theories on Formal Attributes

	Comprehen-siveness	Clarity and Explicitness	Operational Adequacy		Includes Known Findings	Parsi-mony	Empirical Research Generated
			Man	Environment			
Barker	2	2	1	2	3	2	2
Newcomb, Clark, & Trow	2	2	1	2	1	2	2
Holland	2	3	3	2	2	3	2
Stern	2	2	3	2	2	2	2
Pervin	2	2	2	2	2	2	1

1 = Inadequate
2 = Improvement Needed
3 = Adequate

broadly gauged. Table 26 is more comparatively specific by evaluating each of the theories for meeting the formal criteria. As before, the judgments—"adequate," "in need of improvement," "inadequate"—are approximate. Justification for these broad ratings has been presented in the preceding chapters as well as in this one.

Final Comments

The review of the various theoretical orientations makes it evident that the area of person-environment interaction is a long way from having a theory that may be considered a full-fledged general theory. From the present vantage point the most glaring weakness of the theorizing is the lack of emphasis upon the physical environment. Apparently, over the years, it has been assumed that organismic and social variables will be more productive in explaining and predicting human behavior. It may be that physical environmental variables are poor competitors in directly accounting for behavioral variance. However, the results are not yet in and when they are they may provide some surprises (Claik, 1970). There is growing belief that the physical environment does profoundly influence psychological states and social behavior.

None of the theories presented in this book begins to approach perfection. Additional research will probably make these theoretical orientations appear even more inadequate. However, future theorists will no doubt be able to benefit from their predecessors' errors and, hopefully, will then arrive at more sophisticated formulations. Whatever the outcome, these theories are the beginning from which greater theoretical and research sophistication will become possible.

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